

4.0 ENVIRONMENTAL CONSEQUENCES

There are no changes in this section of the Final Environmental Impact Statement and Section 4(f) Evaluation (FEIS) from those presented in the *Supplement to the Draft Environmental Impact Statement and Section 4(f) Evaluation (SDEIS)*, except as noted by the use of boldface type. The changes are primarily editorial, except for Section 4.6, 4.7, 4.10, 4.11, 4.19, and 4.23 where text was clarified and additional coordination was added.

4.1 Transportation Facilities

4.1.1 Roadway Facilities

FAP Route 340 would provide the north-south circumferential highway missing from the highway system and study area, thus providing a high speed link for commuters bound for DuPage County and northwest Cook County. In doing so, it also provides an additional crossing over the Des Plaines River.

During the construction of FAP Route 340, the east-west roads crossing it would be improved within the limits affected by construction. Gougar Road and 163rd Street would be paved in the area of the crossings with FAP Route 340. Also, the interchange crossroads (i.e., U.S. Route 6, Illinois Route 7, 143rd Street, Illinois Route 171, and 127th Street) would be widened including left turn lanes in coordination with the agencies that have jurisdiction of the crossroads.

4.1.2 Other Transportation Facilities

No effects to the operations of the rail lines, the Chicago Sanitary and Ship Canal, or the Des Plaines River would be expected since FAP Route 340 will cross above them providing appropriate clearances.

FAP Route 340 would not affect aeronautical operations if the Lemont Landing Field (**also known as Maletich & Dineff Restricted Landing Area**) is reopened because the highway will be below its clear zone.

[Phrase deleted] PACE has identified three locations within the FAP Route 340 corridor for potential park-and-ride sites: U.S. Route 6 near Cedar Road, Illinois Route 7 near Gougar Road, and at Interstate Route 55. Interchanges are also recommended at these locations which will complement PACE's potential park-and-ride sites.

Usage of Old Plank Road Trail and Centennial Trail could be enhanced by a connection to the proposed bikeway for FAP Route 340.

4.2 Social Impacts

4.2.1 Communities

Bolingbrook lies to the north of the **recommended** FAP 340/FAI 55 interchange and will not be directly affected by the **recommended** project. Existing land use in this area is industrial and is not expected to change after highway construction. The planned interchange will be a highway to highway interchange and therefore no local access will be available, and development surrounding the interchange is not anticipated.

No direct impacts to New Lenox are expected to occur due to the currently **recommended** FAP 340 project. However, the proposed South Suburban Expressway alignment may cause various impacts to this community. The configuration of the South Suburban alignment is currently under study. The resulting alignment may or may not bisect the eastern portion of New Lenox. If bisected, community cohesion impacts, such as residential displacements, noise and visual impacts to remaining residents, may occur. Property values may be affected as well as travel patterns and access.

Although none of the established incorporated communities in the project area, (Bolingbrook, Woodridge, Romeoville, Lemont, Lockport, New Lenox and Joliet) will experience direct impacts due to the FAP 340 project, these cities may experience indirect impacts due to this project. These impacts may include increased residential and commercial development and higher property taxes.

In unincorporated areas along the length of the alignment, increasing construction of residential units is occurring. The Build Alternative is likely to continue the demand for new units within the project area. Local developments such as Broken Arrow Subdivision and Internationale Centre will benefit from the proximity to the limited access transportation facility.

In evaluating community values, attitudes have been identified toward the areas' existing conditions and toward the impacts of the **recommended** project. The basis for attitude identification were meetings with individuals as well as groups and organizations, official planning documents, comments by local politicians, and comments obtained from public meetings, questionnaires, and interviews.

Based on comments made by residents at the public meeting, attitudes appear to vary mainly by the length of time in the County, and secondly by proximity to the [word deleted] alignments. Those people who have lived and worked in the County for a period of time (particularly farmers) indicated that they had known about the proposal for FAP Route 340 for years and generally saw it as an opportunity. In addition, people who lived in the established communities, such as Joliet and Lockport, saw it as a potential benefit to the area. The people who lived in these two cities are not in areas adjacent to the **recommended** facility.

People who have recently moved into the County's new residential areas along the path of the **recommended** facility have a more negative view. They generally moved to Will County, and

Homer Township in particular, because it offered the opportunity of "country" living while still convenient to other parts of the region. With the **recommended** FAP Route 340, and the perceived associated development, they see one of the primary reasons for their moving to the County being destroyed.

4.2.2 Residential Relocations

Approximately **52** residences will be purchased under the Build Alternative. Based on the average household size in Will County, approximately **155** residents will be relocated (Exhibit 4-1). Minority groups and persons belonging to special needs groups will not be adversely affected by displacement or relocation. There is no shortage of comparable housing in the project area as evidenced by the residential developments which are growing throughout the area. Also, existing housing resources are available in the cities adjacent to the project area. Refer to Section 4.23.2 for further details.

ISTHA will provide relocation assistance pursuant to its Guidelines for the Reimbursement of Costs Incurred in the Displacement of Residences and Businesses. Before acquiring land, all properties are appraised on the basis of comparable sales and land use values in the area. Owners of property to be acquired will be offered and paid fair market value for their property rights. A slightly different process is followed if only a portion of a property is to be acquired. Financial assistance is also provided for eligible relocatees to assist in moving.

4.2.3 Public Facilities

Construction of FAP Route 340 will slightly modify access to the Assembly of God Church. The right-of-way for the **recommended** 159th Street interchange requires unimproved frontage from church property. The **preferred** highway alignment avoids impacts to the cemeteries on 127th Street.

Northwest Homer Fire Protection and Ambulance District (FPD) Station No. 1 lies within the access control limits. The east driveway will be closed, due to the proximity of the southbound frontage road.

This change in access to the fire station will have no effect on the operations of the facility, because the west entrance and the emergency entrance will have access to 143rd Street via a flush median. The station shall be given preemption capability for the adjacent ramp signals.

FAP Route 340 will have little impact on the fire, police, ambulance service, and school demands. There will be some demand increase in the project area primarily based on projected population and employment growth for the Counties and impacted areas. Public services will be maintained during construction of FAP Route 340 by way of detours, runarounds, and staged construction.

4.3 Economic Impacts

4.3.1 Business Impacts

The preferred alignment for FAP Route 340 would displace three businesses: Southwest Stainless Inc. on New Avenue, the All Line Autobody Shop on Joliet Road, and the Silver Ranch (an equestrian facility) on Illinois Route 171 near 139th Street. Due to the relatively small size and nature of these businesses, relocation should be possible in the same general vicinity. Open parcels along New Avenue and 127th Street are large enough to accommodate Southwest Stainless, Inc. Therefore Southwest Stainless, Inc. would be able to relocate to a site, of suitable size and location, that would not cause adverse additional travel to the business or its employees. Available parcels along Joliet Road would also allow the All Line Carstar Autobody Shop to be relocated. Due to the rural nature of the area, there are also parcels where the Silver Ranch would be able to be relocated. The relocations, if desired by the businesses, would be decided upon prior to demolition of existing facilities. Assistance for relocation would be provided by ISTHA's Guidelines for the Reimbursement of Costs Incurred in the Displacement of Residences and Businesses.

Right-of-way would also be required from four businesses with the preferred alignment. Businesses which could be affected include Doede and Reliable Nurseries located on U.S. Route 6 and 143rd Street, respectively; Thomas Steel within the Des Plaines River Valley; and Homer Tree Service on Illinois Route 171. A standard access road would be provided from the east to the northeast portion of the business. Construction of the project requires frontage lands from and a new driveway for Reliable Nursery. Both are expected to continue with normal day-to-day business. The project would cross Thomas Steel on a bridge. Land for pier placement would be required from the company's rail yard. Pier placement would not impede the use of the rail yard.

Certain types of businesses are more sensitive to location with respect to the roadway than others. Retail businesses, and those dependent on accessibility and high visibility, are more directly affected by their physical proximity to a roadway. Some retail businesses are likely to develop near interchanges to serve travelers on FAP Route 340. Other, existing retail businesses may relocate to these interchange areas from the central business districts in the local communities such as Lemont and Lockport. This phenomenon is often interpreted as growth. In many instances it is only a redistribution of some existing activities. The number of retail businesses relocating toward the highway would be anticipated to be small, and therefore would not result in a measurable adverse impact to the existing business communities. However, manufacturing firms are influenced more by the overall regional accessibility. Since one of the purposes of the project is to improve regional accessibility, manufacturing firms will also tend to locate near the interchanges in order to have better access to FAP Route 340. The new highway would be a transportation benefit to these manufacturing companies as well.

4.3.2 Employment

Construction-related jobs will be created by the project. The cost of construction of FAP Route 340 is estimated at \$390 million (exclusive of right-of-way acquisition). Based on the employment multipliers given by the FHWA (Gorman, 1985), the following range of jobs may be created as a result of the **recommended** project. The job estimates are projections for one employee for one year (1,600 hours). Direct (primary) employment is defined as on-site construction jobs while indirect (secondary) refers to off-site jobs related to the manufacture or sale of project materials or input. These jobs range from a low of 2,890 on-site jobs and 3,750 off-site jobs, to a high of 3,800 on-site and 4,950 off-site.

4.3.3 Tax Revenues

The short-term impact of the Build Alternative will be a loss of real estate property tax. The short-term loss is from lands required for the FAP Route 340 right-of-way and interchanges. Some of this land will be required from the Forest Preserve District of Will County. However, this land is not taxable. In addition, agricultural land, which will be required for the project, is taxed at the lowest rate compared to other land uses.

An analysis of Will County property taxes indicates this project will not remove greater than 2% of tax revenue for any one existing taxing body, as illustrated in Table 4-1. An analysis for Lemont Township revealed similar results.

New development resulting from the improved accessibility provided by the project, may be added to the tax rolls. This could result in an increase in assessed evaluation because of the new development, and an overall increase in the total taxes collected. Also, an increase in tax revenues may result from an increase in property values due to the improved accessibility provided by FAP Route 340.

4.3.4 Property Values

Property values are increasing in the project area, partially based on the assumption that a highway is going to be built. Thus, under the Build Alternative, the increase in property values is also expected to continue. Improved access to a highway may further increase the value of residential and commercial properties.

4.4 Land Use and Zoning

The project is in accordance with the NIPC, CATS 2010 Transportation Plan, and local land use plans. The **recommended** highway has been included in land use plans throughout the project area. Regional (Northeastern Illinois Planning Commission, NIPC, 1984) and local plans assume that a highway will be constructed in the corridor (Will County 1990, Lockport 1984, and Joliet 1984, Romeoville, Woodridge).

The likely impact on land use and zoning in the FAP Route 340 corridor is visually presented on the Generalized Existing Land Use Exhibit (Exhibit 2-4) and the Generalized Proposed Land Use

Exhibit (Exhibit 2-5). South of Illinois Route 171, the greatest change will be from agricultural to industrial land use. This area also is planning for significant commercial development north of U.S. Route 6. At Illinois Route 7, some low density residential land use is expected to be displaced by industrial use.

Between Illinois Route 171 and the Des Plaines River Valley, existing low density residential land use and open lands are expected to be replaced by residential land use. The residential development, while higher in density, is still anticipated to be single family homes.

North of the Des Plaines River Valley, land use is not expected to change.

South of the Valley, the rural "flavor" of the area is anticipated to change to a more suburban character. Within the Valley, the sharply contrasted land uses are expected to remain: forest preserves north of the river and heavy industrial use to the south.

The changes outlined above have been anticipated by the local planning agencies and are welcomed by the county, township, and municipal officials.

The No-Build Alternative will conflict with local and regional land use and zoning plans in that without FAP Route 340, the anticipated development may not occur.

4.5 Agricultural Impacts

Agricultural impacts are reported in the *Agricultural Resources Technical Report* (1991) and summarized in this section.

As previously discussed in the Land Use sections (2.5 and 4.4) and as shown in the future Land Use Plans (Exhibit 2-5) agricultural lands in the FAP Route 340 corridor are anticipated by the local planning agencies to be converted to other uses in the future. However, for the quantitative purposes of this document, the discussion will assume the agricultural lands will be impacted by the preferred alignment for FAP Route 340 prior to other conversions.

The Secondary and Cumulative Impacts section (4.20) explains that some of the agricultural land not directly taken for the highway right-of-way would be expected to be converted to other uses such as industrial developments. This conversion could be classified as a secondary impact of building the highway since it would be caused by future developments accommodated by access from the **recommended** highway facility. The secondary impacts are discussed in qualitative terms.

Table 4-1
Will County Tax Revenue Losses

	Total Taxes Extended 1991	Estimated Taxes Lost Due to Project Based on 1991 Tax Year				
Taxing Bodies Affected	Total	New Lenox Twp.	Homer Twp.	DuPage Twp.	Total	% Lost
006 Will Co. Forest Preserve	\$8,558,133	\$198	\$2,791	\$56	\$3,045	0.04%
011 Will County Bldg. Comm.	\$3,925,174	\$91	\$1,281	\$26	\$1,398	0.04%
290 DuPage Twp. Town Fund	\$730,018			\$35	\$35	0.00%
291 DuPage Twp. General Ass.	\$108,610			\$6	\$6	0.01%
292 DuPage Twp. Road Fund	\$651,663			\$17	\$17	0.00%
315 New Lenox Town Fund	\$397,103	\$173			\$173	0.04%
316 New Lenox Road Fund	\$944,810	\$231			\$231	0.02%
321 Homer Twp. Town Fund	\$365,350		\$2,022		\$2,022	0.55%
322 Homer Twp. Road Fund	\$1,405,270		\$6,565		\$6,565	0.47%
407 Homer Twp. Fire Dist.	\$604,905		\$5,203		\$5,203	0.86%
408 Lemont Fire Dist.	\$492,189			\$253	\$253	0.05%
413 New Lenox Fire Dist.	\$1,183,802	\$524			\$524	0.04%
414 Northwest Homer Fire Dist.	\$1,016,063		\$2,404		\$2,404	0.24%
606 School Dist. 33-C	\$7,275,955		\$24,718		\$24,718	0.34%
620 School Dist. 92	\$3,384,667		\$11,801		\$11,801	0.35%
625 School Dist. 122	\$5,447,782	\$2,466			\$2,466	0.05%
636 High School Dist. 205	\$13,542,398		\$34,168		\$34,168	0.25%
640 High School Dist. 210	\$11,627,030	\$2,064			\$2,064	0.02%
645 School Dist. 365-U	\$25,093,437			\$1,597	\$1,597	0.01%
655 Community College Dist.	\$9,885,089	\$263	\$3,717	\$75	\$4,055	0.04%
821 Lockport	\$1,666,071		\$4		\$4	0.00%
822 Lockport Road & Bridge	\$53,728	\$81			\$81	0.15%
829 New Lenox	\$559,436		\$1		\$1	0.00%
830 New Lenox Road & Bridge	\$183,628	\$79			\$79	0.04%
865 Woodridge	\$15,248			\$10	\$10	0.07%
866 Woodridge Road & Bridge	\$1,283			\$1	\$1	0.08%
900 Woodridge Park Dist.	\$68,719			\$26	\$26	0.04%
902 Lockport Park Dist.	\$1,919,364		\$9		\$9	0.00%
906 New Lenox Park Dist.	\$711,691	\$339			\$339	0.05%
945 Woodridge Public Library	\$9,247			\$6	\$6	0.06%
950 Fountaindale Public Library	\$2,550,724			\$143	\$143	0.01%
954 New Lenox Public Library	\$465,800	\$207			\$207	0.04%
966 Homer Public Library	\$579,135		\$2,706		\$2,706	0.47%
970 Woodridge Special Services 2	\$172,505			\$104	\$104	0.06%
999 Will County	<u>\$28,834,376</u>	<u>\$9,399</u>	<u>\$9,399</u>	<u>\$189</u>	<u>\$10,253</u>	<u>0.04%</u>
Total	\$134,430,403	\$7,381	\$106,789	\$2,544	\$116,714	0.09%

Definitions of the terms used to discuss impacts are found in Table 4-2. A detailed list of all farm tracts and a map showing the location of all impacted farmlands in the project area are included in the *Agricultural Resources Technical Report*.

4.5.1 Prime and Important Farmlands

Table 4-3 gives the total acreage of prime and important farmlands that will be converted under the Build Alternative based on soil types.

4.5.2 Agricultural Land Conversion and Production Loss

Approximately 69 percent of the estimated 1009 acres required for the highway right-of-way is presently used for productive farming. Table 4-4 shows the total acreage of agricultural lands (productive, woodland, buildings, other) required for FAP Route 340 based on classifications from the Agricultural Stabilization and Conservation Service. Production loss statistics resulting from the Build Alternative are also given in Table 4-4.

4.5.3 Affected Farm Operations

Table 4-4 discusses the number of affected farm operations resulting from the Build Alternative. These impacts are illustrated in Exhibit 4-2.

4.5.4 Land Evaluations and Site Assessment

The Illinois Department of Agriculture uses the Land Evaluation and Site Assessment (LESA) System to assess overall impacts to agriculture caused by state and federal projects. The land evaluation system is used to rate the agricultural productivity of farmland as indicated by soils information. The Natural Resources Conservation Service (formerly the Soil Conservation Service) determines and provides soils information on the U.S. Department of Agriculture Form AD-1006. The federal Farmland Protection Policy Act (49 FR 17716 ff) provides guidelines used in preparing this form. The Site Assessment System considers factors relevant to agricultural concerns such as compatibility with agricultural operations, benefits to agriculture, and compatibility with local comprehensive land use plans. Table 4-5 shows the cumulative results of the approved LESA analysis for the preferred alignment. Early in the study all of the alternate alignments were determined to be comparatively similar regarding agricultural impacts. However, impacts to other resources such as residential locations and wetlands varied widely for the alternate alignments, resulting in a strong influence in the selection of the preferred alignment. Thus, only the preferred alignment received the LESA analysis. The higher the score, the more viable the land is from an agricultural perspective.

Table 4-2
Glossary of Terms Used in Agricultural Impact Analysis

Term	Definition
Farm Unit	A farm unit is one or more parcels of land, not necessarily contiguous or under the same ownership, that are farmed as a single operation.
Affected Farm Unit	An affected farm unit is a unit operation from which right-of-way or easement will be required to construct a recommended highway.
Affected Owner	A landowner with which right-of-way negotiations will be necessary. The number of owners can be lower or higher than the number of affected farm units, because some individuals may own more than one unit affected by highway construction or a unit may have multiple owners.
Operations Affected by Adverse Travel	Farm operations for which the new highway will cause additional travel from one part of the operation to another.
Farmer Adverse Travel	This term is defined as the length of additional travel which a farm operator or owner must undertake to get into fields or onto market roads. It is caused by severance of a farm unit by a new highway and is calculated as extra round trip mileage per field visit.
Severed Farm Operation	Severed farm operations occur when a new highway separates one or more parcels from others within a farm unit, usually resulting in adverse travel for the farm operator.
Severed Parcel	A unit of land that is diagonally or laterally severed by a new highway. Whereas severed operations are determined on the basis of farm operators, severed parcels are determined solely on the basis of ownership patterns.

Table 4-2 (Cont.)

Term	Definition
Landlocked Parcels	A landlocked parcel is a parcel that is created by the taking of right-of-way for road construction, such that it is not accessible by road or easement after construction.
Severance Management Zones	Defined on the basis of acreage, severance management zones are those areas within diagonally severed parcels, used to measure quantitatively the disruption to normal farming operations. The triangular shape is the basis of most problems caused by diagonal land severance. This shape causes point rows, angular field ends, harvest losses due to excessive turning, and overlapping application of herbicides. These problems lead to waste, additional expense, increased field work time, and additional usage of fuel caused by shortened rows and additional turning of equipment.

Table 4-3
Acreage of Prime, Important, and Other Soils
Taken by FAP Route 340 Preferred Alignment

Soil Classification	Acres in Will County	Acres in Cook County	Acres in DuPage County	Total Acreage
Prime	436.8	44.2	13.1	494.1
Important	238.1	27.9	4.8	270.8
* Other	198.2	45.9	0	244.1
Total	873.1	118.0	17.9	1009

* Includes all other areas such as waterways, urbanized areas, etc.

**Table 4-4
Agricultural Impacts
of FAP Route 340**

		Will County	Cook County	DuPage County	Total
Number of Severed Farm Operations		25	5	0	30
Other Affected Farm Operations		12	2	2	16
Severance Mgmt. Zones Created	Acres	202.6	12.0	0.0	214.6
	Number	25	5	0	30
Landlocked Parcels Created	Acres	0	0.0	0.0	0
	Number	0	0	0	0
Agricultural Land Required for Project	Acres	599.5	78.6	17.9	696
Adverse Travel	Miles	19.1	3.9	0.0	23
Farm Displacement	Houses Displaced	20	0	0	20
	Other Buildings Displaced	37	0	0	37
Estimated Annual Farm Production Losses		\$169,000	\$51,000	\$23,000	\$243,000

Table 4-5
***LESA Analysis Scores**
for the FAP Route 340 Preferred Alignment

	Cook County	Will County	DuPage County
Land Evaluation	96	121.5	126
Site Assessment	95	115	43
Total LESA Score	191	236.5	169

* See Appendix B **under US Department of Agriculture** for Form Ad 1006.

4.5.5 Borrow Pits

The location and design of borrow pits if needed will be determined by the contractor. Further discussion of the contractor's rights, responsibilities and goals to minimize impacts to resources is discussed in Section 4.17 (Material Resources). **[sentence deleted]**

4.5.6 Measures to Minimize Impacts to Agriculture

The preferred alignment incorporates several measures to minimize impacts to farmland the Illinois State Toll Highway Authority will either purchase or provide access to farmland remnants created by the construction of the project.

The number of adverse miles traveled due to the landlocking of parcels as a result of highway construction may be reduced by construction of access or frontage roads. The need for construction of special access roads will be determined by considering the cumulative impacts and size of the affected parcels.

Highway construction will require demolition or removal of some farmhouses and other farm buildings. At some locations, it may be feasible to move farmhouses and other farm structures from the affected portion of the farm to a part of the farm that is not affected by highway construction.

Subsurface and surface drainage patterns will be maintained. Drainage features (such as subsurface field tiles) which are affected by highway construction will be mitigated to minimize impacts due to highway construction. This includes repairing and reconnecting drainage tiles severed or damaged by construction operations. Also, ISTHA will have a pay item in the construction contract for exploratory trenches which allows a contractor to locate tile prior to major earth work.

4.6 Forest Preserves and Parks

Forest preserves, parks, and preservation areas in the study area are shown on Exhibit 2-6 and described in Section 2.7. Possible impacts to public recreation areas (as defined by Section 4(f) of

the Department of Transportation Act of 1966 (49 U.S.C. 303) are discussed in detail in Chapter 5. Impacts to parks occur in the northern portion of the impact area, between 127th Street and Interstate Route 55. The preferred alignment will pass through the Keepataw Forest Preserve in Will County and the right-of-way will pass within 200 feet west of the Black Partridge Forest Preserve near the Des Plaines River. The **recommended** highway will cross over the Keepataw Forest Preserve on a bridge, and require approximately 12.4 acres of Section 4(f) land for permanent access and maintenance **and approximately 3 acres for temporary easement**. The actual footprint of the bridge piers on the ground will be less. The preferred alignment will separate a section (approximately 15.7 acres) of Keepataw on the east side. This area would still be accessible land, the existing recreational use of the property will not be altered.

Since Land and Water Conservation (LAWCON) funds were used to purchase the Section 4(f) land in the Keepataw Forest Preserve, it is also considered Section 6(f) property and converted land must be replaced with property of at least equal market value and similar utility. Options for replacement lands exist in the project area. The FPDWC identified four possible mitigation sites, two primary and two secondary, for mitigating any conversion of Section 4(f) and 6(f) property in the Keepataw Forest Preserve. The primary sites were initially considered. The first parcel (approximately 38.9 acres) is adjacent to the west edge of the Keepataw Forest Preserve, south of the Commonwealth Edison property. The location would offer protection of existing wetlands with potential for enhancement and recreation. Protection of a state endangered spotted turtle population site would also occur. The second parcel (approximately 29 acres) is located south of 167th Street (Division Street), north of Dellwood Park, and between the Chicago Sanitary and Ship Canal and the Illinois and Michigan Canal. This location protects an Illinois Natural Area Inventory site, wetlands, and habitat for the federally and state endangered Leafy Prairie Clover. It is also adjacent to existing open space purchased by the Lockport Township Park District with LAWCON funds. Based on the Illinois State Geological Survey's Preliminary Environmental Site Assessment Report for the two parcels, the first parcel was reduced to 30 acres for purchasing consideration. After further coordination with the FPDWC, the first site was determined to be undesirable due to the altered environmental condition of the property as a result of quarrying activities. However, the second replacement property was deemed acceptable by the FPDWC.

Next, the two secondary sites were evaluated. These sites (38.6 and 31.6 acres) are located near Rock Lake along Joliet Road and Illinois Route 53 in the Romeoville area. Initial Site Assessments conducted at these locations identified potential hazardous waste materials that would require further investigations. Therefore, the two secondary sites were eliminated from consideration as Section 6(f) conversion replacement property, because of the risk involved.

In an August 21, 1995 letter from the FPDWC to ISTHA, the FPDWC accepted the conditions outlined in ISTHA's August 9, 1995 letter to serve as the basis for a formal agreement. In the August 9, 1995 letter it is stated that ISTHA requires a permanent easement of approximately 12.4 acres and a temporary easement of approximately 3 additional acres in land located in the Keepataw Forest Preserve for use in connection with FAP Route 340. This property has been appraised at \$6,000 per acre. This land was originally purchased with LAWCON funds. As substitution for this property ISTHA will

provide what has been commonly referred to as the “Lockport Prairie East” site and is referenced previously as the second primary site for LAWCON mitigation. This property was appraised at \$365,000 and is approximately 29 acres in size.

With an interchange at 127th Street, traffic is projected to increase on the crossroad, due to vehicles exiting and entering FAP Route 340. Average daily traffic (ADT) at 127th Street is projected to increase from 2,600 (1992) to 15,000 (2010). (The ADT projection for this area under the No-Build Alternative is 5,000 for 2010). The increase in traffic will affect vehicular access into Lemont Centennial Park's entrance located on 127th Street when visitors will be turning across traffic. These effects will be minimal since the peak hour activities at the park occur at separate times from the interchange's peak hours.

FAP Route 340 will cross Spring Creek on a bridge. Box culverts will be provided as pedestrian tunnels outside of the floodplain for Spring Creek on both sides of the waterway. These structures will complement the greenway plan envisioned along Spring Creek by allowing uninterrupted use of the greenway.

4.7 Bikeways

Numerous meetings and correspondence have taken place in an effort to develop a potential bikeway along the FAP Route 340 corridor. Various options for crossing the Des Plaines River Valley were evaluated and discussed with local agencies interested in a bikeway plan. ISTHA has committed to working with the local agencies on a potential bikeway plan that could benefit the local communities.

Within the FAP Route 340 corridor, the highway design will accommodate the future construction and operation of a bikeway on the upstream (east) side of the highway for drainage considerations (refer to Exhibits 4-3, 4-4 and 4-5). The potential bikeway corridor width is based on **American Association of State Highway and Transportation Officials (AASHTO)** Guidelines for the Development of Bicycle Facilities. The corridor width would allow for two-way bike travel and vary with terrain. ISTHA has agreed to accommodate private, state, or local governmental agencies who are willing to commit the resources necessary for a bikeway within the FAP Route 340 corridor. However, ISTHA is limited by law, its trust indentures, bonding requirements, liability issues and other considerations from designing, constructing, owning, operating or maintaining a bikeway. IDOT and ISTHA will provide preliminary conceptual design services for the purpose of defining the bikeway corridor. The bikeway corridor may be rough graded and seeded by ISTHA depending on further coordination with local agencies. The design, construction, ownership, operation, maintenance and associated costs of any bikeway would be the responsibility of entities or agencies other than IDOT or ISTHA. Because of ISTHA's legal limitations and the restrictions in its bond indentures, ISTHA may not be able to acquire the land necessary for a bikeway unless the acquisition of such land is a necessary part of the project in order to compensate for, or mitigate, various impacts of FAP Route 340.

The ultimate southern connection for the potential bikeway would be Old Plank Road Trail (see Exhibit 2-7), which is being developed as an east-west bicycle/pedestrian corridor in the regional bikeway system. Access to this bikeway could be via Cedar Road. The FAP Route 340 project will accommodate bicycles on the Cedar Road bridge over Interstate Route 80 and the portion of Cedar Road from Interstate Route 80 to the alignment. The **recommended** bridges for Cedar Road over Interstate Route 80 and FAP Route 340 include 10 foot shoulders which would be sufficient to accommodate bicycles without additional improvements. The section of Cedar Road **recommended** for bicycle use also would have 10 foot shoulders signed for one-way bike travel, thus not requiring modifications to be used as a designated bikeway. The local jurisdiction would need to provide for bicycles on the remaining portion of the bikeway (from Interstate Route 80 to Old Plank Road Trail). At U.S. Route 6, the potential bikeway would turn west continuing to use the shoulders up to the interchange where the bikeway would enter the FAP Route 340 corridor (see Exhibits 4-3, 4-4, and 4-5).

At U.S. Route 6 and all other interchange crossroads, access control for the crossroad would be broken to allow for the safe crossing of the street by bicyclists **where there are** traffic signals. Permits for the access control breaks would be required from the agency having jurisdiction over the crossroad. Signage would be provided to alert motorists to crossing bikes. At the request of the Forest Preserve District of Will County (FPDWC), the highway would accommodate access to the Spring Creek Greenway. A ten foot high by ten foot wide box culvert would be constructed immediately north of Spring Creek and a slightly smaller seven foot high by ten foot wide box culvert would be placed south of the creek to allow east to west crossing of the mainline by horses, bicycles and pedestrians. The seven foot clearance on the south side of Spring Creek is due to the restrictive highway profile. Prior to construction of these structures, an agreement would need to be reached to identify the appropriate agency to assume jurisdiction of these structures including ownership, operation, maintenance and security. At Bruce Road, and most other non-interchange crossroads, access can be accommodated by the **recommended** shoulders on the crossroads.

The potential bikeway could cross the streams and minor waterways on individual, prefabricated bicycle bridges located outside the mainline access control. However, since these crossings will be the responsibility of the agencies developing the bikeway, the selection of an appropriate method of crossing will also be the responsibility of the bikeway implementing agencies. Excluding any Des Plaines River Valley crossing, preliminary costs were estimated for right-of-way, design, and construction of the bikeway at \$3.7 million (1993).

As shown on Exhibit 4-5, several options have been proposed to cross the Des Plaines River Valley.

- Option One - Widen the mainline bridge for a bikeway adjacent to the mainline traffic.
- Option Two - Suspend a bikeway structure underneath the mainline bridge.
- Option Three - Build a low-level bridge over the Des Plaines River and convert a haul road through Black Partridge Forest Preserve into a bikeway after the mainline bridge construction is completed.

- Option Four - Build a low-level bridge over the Des Plaines River, modify the Commonwealth Edison service road for bikeway use, and widen Bluff Road.
- Option Five - Improve the local roads and the Lemont Road bridge for bikeway use.

The first option is to widen the mainline bridge to add a bikelane separated by a parapet wall. With this wider bridge, bicyclists would travel next to the highway traffic, approximately 80 feet above the Des Plaines River Valley. This option would increase the cost of the bridge by about \$8.8 million (1993) for the design and construction of the additional pavement and separation barrier. Benefits include a straight north-south connection for bicyclists as well as minimizing impacts to the sensitive forest preserves by staying above them. However, a connection to the Centennial Trail would be prohibitive because of the height and adjoining land use constraints. Although the bikeway would not go through the forest preserves at grade, the bridge piers would have to be larger and would result in a wider footprint through the Keepataw Forest Preserve. The wider footprint could cause additional negative impacts to the environmentally sensitive River Valley. Option One while technically feasible, will not, after consideration by ISTHA, be implemented due to irreconcilable issues including the above referenced environmental impacts to the River Valley, agency liability, and responsibility for construction, maintenance and operation of the **[word deleted]** structure.

A second option is to suspend a separate bridge under the mainline bridge. The south abutment for the bike structure would be south of New Avenue due to the necessary vertical clearance requirements for the adjacent railroad. A path would be developed for access from the bikeway to New Avenue. The bridge, hung under the mainline, would be protected from rain and snow. The structure would be located between the pier columns. This second option utilizing a suspended bikeway bridge would add approximately \$4.8 million (1993) to the project cost for design and construction. This cost is based on pre-fabricated, 90 foot long bikeway bridge units with allowances for specific details and handling techniques to facilitate construction. At Centennial Trail, a "T" connection could be constructed, but because of the minimum clearance requirement of 44 feet above the Chicago Sanitary and Ship Canal, the connection would be difficult and expensive. This connection would tie in the Centennial Trail to the bikeway system as a potential benefit. However, the extra costs for this connection are not included in the additional \$4.8 million previously mentioned for the suspended bridge. The north abutment would be placed on the south side of Bluff Road, allowing access to the forest preserves. This option provides a continuous north-south route for bicyclists and also allows for possible future access to Centennial Trail. A disadvantage of this option is the difficulty in making the connections on the ends of the bridge and to Centennial Trail. Option Two while technically feasible, will not, after consideration by ISTHA, be implemented due to irreconcilable issues including, agency liability, and responsibility for construction, maintenance and operation of the **[word deleted]** structure.

A third option to cross the River Valley was developed in conjunction with the construction of the mainline bridge (refer to Section 3.5). This option was based on a haul road being built through the Black Partridge Forest Preserve and modified to serve as a bikeway after construction is completed.

The bikeway would depart from the FAP Route 340 alignment at 135th Street and travel west then cross the Chicago Sanitary and Ship Canal via the new 135th Street bridge. The bikeway would go north and east and follow the established Centennial Trail. At the FAP Route 340 alignment, the bikeway would utilize a separate, low-level bridge which will be built as part of the haul road construction to cross the Des Plaines River. The bikeway would continue past the Commonwealth Edison transmission lines along the haul road created from an existing trail through Will County's Keepataw Forest Preserve and Cook County's Black Partridge Forest Preserve. The bikeway would remain on the haul road up to Bluff Road at which point bicyclists could follow the shoulder west to connect to the bikeway along the east side of the highway alignment. Converting the haul road to a bikeway, retaining the low-level bridge, and upgrading the shoulders on the local roadways would increase the project cost by approximately \$1.0 million (1993) for design and construction. The low-level bridge is assumed to be a pre-fabricated, thru-truss structure. Additional impacts would occur from construction of the separate low-level bridge. The bikeway would provide access to Centennial Trail, Cook and Will County Forest Preserves, Illinois and Michigan Canal, and the River Valley floor. However, this option does not accommodate continuous north-south bicycle travel since it requires circuitous travel west of the FAP Route 340 corridor. This option is also dependent upon the initial use of a haul road through the Black Partridge Forest Preserve. After the Public Hearing, the Cook County **Forest Preserve District (FPD)** indicated that they did not want to allow a haul road through Black Partridge since the mainline bridge can be built without it. Option Three will not be implemented since the haul road will not go through Black Partridge to Bluff Road. However, this connection has been identified as a possible future link that the Cook County FPD may pursue as a separate bikeway project.

The fourth option is a variation of the third bikeway concept. Instead of utilizing the haul road, the Commonwealth Edison service road could be maintained after construction as a bikeway from Lemont Road west to the highway alignment. At that point, the trail would use the low-level bridge described above and follow the third option. On the north end, the shoulders on Bluff Road would have to be widened to enable bicyclists to return back to the FAP Route 340 alignment from Lemont Road. Design and construction costs for these bikeway improvements would be comparable to those for the third option of \$1.0 million (1993). This option also provides similar benefits and disadvantages as the third option, except the use of Bluff Road for bicycle travel poses serious safety concerns because of the road's sharp horizontal curves and rolling profile. Additionally, the heron colony near Goose Lake would potentially be impacted by this bikeway option due to its proximity to the Commonwealth Edison service road. Option Four will not be implemented due to the concerns both from a safety aspect (poor horizontal and vertical geometrics) and an environmental aspect (potential negative impacts of widening or modifications to geometrics) on Bluff Road, potential impacts to the heron colony, and lack of support from the bikeway groups.

The fifth option begins at 127th Street and has two potential routes to get to the Lemont Road bridge. Bicyclists would travel east on 127th Street to Timberline Drive, proceed north to New Avenue, and then turn east to Lemont Road. The other route would follow 127th Street east to State Street and then continue north to Lemont Road. Once at the bridge, bicyclists would use the existing walkway on the east side of the Lemont Road bridge or experienced cyclists may use the

roadway itself. The bikeway would continue north and cross to the west side of Lemont Road at Bluff Road where the local roads just to the west could be used to connect to Davey Road. This option also allows for links to the existing trails in the area. The Centennial Trail could be joined by using the Stephen Street bridge over the Des Plaines River. The Waterfall Glen Forest Preserve bikeway could be reached from Lemont Road along Bluff Road to the east. The fifth option would include improving the shoulders along 127th Street, New Avenue, Lemont Road and Davey Road. The existing walkway on the Lemont Road bridge is narrow and utility poles within the path further restrict travel. The cost of designing and upgrading the existing path on Lemont Road and improving the shoulders on the local roadways would cost about \$910,000 (1993) extra. Again, this option does not provide a continuous north-south bike path along the entire FAP Route 340 alignment. Circuitous bicycle travel to the east would be necessary to join the bikeway on both sides of the River Valley. The adverse travel could be considered a disadvantage for direct north-south trips or a benefit for access to downtown Lemont.

The north terminus of the bike path would be at Davey Road. Davey Road would be used to connect to Murphy Road which would be used to cross Interstate Route 55. Woodridge has plans to widen the current two lane structure to five lanes. Woodridge plans to accommodate bicycle travel on the Murphy Road bridge and their plans to develop a bikeway along the Woodward Avenue extension would connect to the Interstate Route 355 corridor which has a bikeway envisioned by the DuPage County FPD and other local bikeway planning agencies, making it a suitable connection.

Based on comments received at the Public Hearings, the location of the proposed bikeway between Bluff Road and Davey Road was reevaluated. It was suggested that the potential bikeway be planned on the east side of FAP Route 340 adjacent to public owned properties. This location would also accommodate direct access to the trail system envisioned in DuPage County. Since FAP Route 340 will be built on a drainage ridge, locating the bikeway on the east side of the highway would not cause hydraulic impacts.

The preferred FAP Route 340 roadway alignment crosses four proposed City of Lockport and Lockport Township Park District bikeway courses. These hiking and biking trails would occur along Long Run, Big Run, Fiddymont Creek and Fraction Run in Lockport and Homer Townships. The build alternative will have visual impacts on these proposed area bikeways as well as existing trails such as Centennial Trail. Where reasonable and feasible, every opportunity will be taken to accommodate these regional bikeways and include them in any bikeway planning process. In areas where there is no existing trail at the time of construction, the local agency must bear the cost of any additional improvements to the local bikeways beyond the scope of this project.

Plans for the FAP Route 340 bikeway will include three elements. First, ISTHA's conceptual design will identify the land which could accommodate two-way bike travel. Second, the construction of two box culverts will occur at Spring Creek. Third, the bikeway corridor may be rough graded and seeded depending on further coordination with local agencies. It is recommended that if the construction across the Des Plaines River Valley is pursued and implemented by the local agencies, then it should be done in conjunction with the mainline construction to minimize

disturbance to the environment. The environmental impacts were assessed based on worst case conditions for a potential bikeway.

Coordination with the bikeway community, comprised of local municipal agencies, the Northeastern Illinois Planning Commission (NIPC), and forest preserve districts, has been an ongoing process to plan a potential bikeway and to determine a preferred option to cross the Des Plaines River Valley. After a thorough discussion of the various options for crossing the River Valley at a bikeway meeting on August 4, 1993 (**See Appendix B under Will County Forest Preserve District**), the local bikeway community expressed their opinion that a combination of Options Two and Three should be selected as the preferred bikeway alternative. Appendix B contains letters from the local agencies expressing support for the bikeway concept and indicating their preference for the River Valley crossing. Letters are included from agencies/organizations such as Openlands Project, the Chicagoland Bicycle Federation, the forest preserve districts, NIPC, and local park districts. This combination would provide a direct north-south route with a suspended bikeway bridge as well as a low-level bridge over the Des Plaines River allowing connection to Centennial Trail. The various options and public comments have been evaluated and documented in the *Draft Environmental Impact Statement and Section 4(f) Evaluation*. Financial participation for the bikeway was discussed at a meeting on December 21, 1993. At the same meeting ISTHA expressed concern over the first and second options for crossing the River Valley, citing difficulty with issues such as costs, liability, bonding, and competing modes of transportation. Coordination between IDOT, ISTHA and local agencies has continued regarding issues such as the ownership, operation, and funding of the bikeway. No commitments have been made with regard to funding or developing any River Valley crossing.

At a meeting on January 31, 1995 (see Appendix B under **Will County Forest Preserve District, FPDWC**) and during subsequent correspondence, certain commitments were made by local agencies to accept responsibility for the various sections of a potential future bikeway. The following is a summary of the understandings concerning which local agency would ultimately be responsible for the potential bikeway for the following geographical areas:

U.S. Route 6 to 135th Street - FPDWC

135th Street to bluffs south of New Avenue - Village of Lemont

Centennial Trail to south of Bluff Road - FPDWC

(along haul road/maintenance road)

Bluff Road to Davey Road - FPDWC

The Keepataw Forest Preserve has been identified as a potential destination for bicyclists. The haul road through Keepataw and the low-level bridge over the Des Plaines River will remain after construction is completed to serve two functions. They will be used for any potential bikeway section from Centennial Trail to the bluffs just south of Bluff Road in Keepataw, and they will provide access to the bridge piers for inspection and maintenance purposes. Although a bikeway bridge crossing the entire Des Plaines River Valley is not proposed at this time, access will be available to Keepataw from several locations utilizing portions of the various options previously discussed. The FAP Route 340 bikeway would provide access to 135th Street where bicyclists can

travel west using Romeoville's proposed 135th Street bridge over the Des Plaines River to Centennial Trail, traveling north and east to the FAP Route 340 bikeway again (part of Option Three). This section of the potential bikeway would connect Keepataw and Isle a la Cache Preserves via Centennial Trail as desired by the FPDWC. Access is also available from the FAP Route 340 bikeway to 127th Street going east to Timberline Drive. From that location bicyclists could travel north on Timberline Drive to New Avenue, turn east to the Lemont Road bridge where there is an existing crossing of the River Valley (part of Option Five). Access to Centennial Trail would then be available using the Stephen Street bridge on the west side of the Lemont Road bridge. The Metra commuter rail station located on New Avenue may also be a destination for bicyclists since access would be available using a potential FAP Route 340 bikeway from Timberline Drive.

In summary, the accommodations for a potential bikeway are different depending on the scheduling of its construction. ISTHA presently intends to perform rough grading to accommodate a potential bikeway in various areas within its right-of-way during construction of the project where such rough grading is feasible. At the present time, no constructing agencies have come forward with a commitment or willingness to own, operate, maintain, and fund the construction and development of a bikeway. Without concurrent construction of a bikeway, the only accommodation that can be made is that ISTHA may be willing to share part of its right-of-way with a bikeway provided that an agreement with the constructing agency is reached which would resolve any legal, ownership, operational, maintenance, and liability issues. Under any such arrangement, the constructing agency would assume all responsibility for earth retention structures, bridge and drainage modifications, and all safety considerations.

4.8 Cultural Resources

4.8.1 Historic and Archaeological Resources

The historic and archaeological resources review has been coordinated with the Illinois State Historic Preservation Office (ISHPO), in accordance with the requirements of 36 CFR 800.4.

The **recommended** highway does not impact the Isle a la Cache Museum, the Lockport Historic District, or the Swede Town settlement. A benefit of the project is the improved access provided to the I & M Canal National Heritage Corridor. The **recommended** highway will pass over the Illinois and Michigan Canal on a bridge with a vertical clearance of approximately 80 feet. Piers supporting the bridge will be placed on the northern side of the Illinois and Michigan Canal right-of-way, approximately 15 feet or 55 feet (steel bridge alternate or concrete bridge alternate, respectively) from the edge of the actual Canal. The project will require a small portion of this property, but it will not impact the use of the Canal. Alternative pier locations were considered to avoid taking the property. However, given the existing land uses for adjacent property and span length limitations, no prudent or feasible alternatives were found. The Illinois and Michigan Canal right-of-way is about 250 feet wide, while the Atchison, Topeka, and Santa Fe Railroad maintains railroad tracks on the adjacent 80 feet of property to the north. This entire distance could not be

spanned; to minimize impacts to the property, the piers are located as far north as possible without interfering with the railroad operations. A finding of no adverse effect was determined by the Illinois Historic Preservation Agency **and was approved by the Advisory Council on Historic Preservation** (see letter dated November 29, 1993 **and affirmed in a Memorandum of Agreement** in Appendix B **under Illinois Historic Preservation Agency**).

The preferred alignment does not impact the two Greek-Revival structures or a two-story Italianate residence. Another structure, a prefabricated, metal, "Lustron" house located in Section 6 of Homer Township will be impacted by the project. The structure was determined eligible for listing on the National Register of Historic Places (see letter dated February 3, 1992 in Appendix B **under Illinois Historic Preservation Agency**) and coordination with ISHPO has taken place. A mitigation plan to minimize the project impacts to the structure was formulated. The structure will be recorded according to Historic American Building Survey standards and a plan will be formulated to market and move the structure to a setting which is deemed suitable by the ISHPO. A Memorandum of Agreement (MOA), Appendix B **under Illinois Historic Preservation Agency**, has been **signed [words deleted]** to formalize the mitigation treatment and fulfilling all the requirements of the regulations implementing Section 106 of the National Historic Preservation Act.

Improvements to the intersection at 163rd Street and Gougar Road will require the relocation of the John Lane commemorative marker (for development of the first steel-tipped plow). Left turn lanes will be added on **[words deleted] Gougar Road** at this intersection. Additionally, both streets will be grade separated over FAP Route 340. To facilitate these improvements, although the structure was determined ineligible for listing on the National Register of Historic Places (see letter dated March 12, 1990 and April 19, 1993 in Appendix B **under Illinois Historic Preservation Agency**), the marker will be protected and relocated on the same property subject to the current landowner's approval. **A memorandum dated June 21, 1995 contains a letter of concurrence from the State Historic Preservation Officer.**

A program of sub-surface evaluation has been completed by Northern Illinois University for **[word deleted]** sites discovered during Phase I survey. All of the sites have been subject to heavy erosion and none meet the criteria for listing on the National Register of Historic Places (see no effect concurrence by the ISHPO, letter dated March 30, 1995 in Appendix B **under Illinois Historic Preservation Agency**).

4.9 Geology and Mineral Resources

No active quarries or sand and gravel operations are within the [word deleted] FAP Route 340 alignment **although there are operations in close proximity to the FAP Route 340 bridge.** Therefore, FAP Route 340 will not affect any commercial mining operations in the project area. One of the parcels investigated as a potential LAWCON replacement property (see Section 4.6) **is currently being mined for the [phrase deleted]** dolomite resources. Transfer of this property to forest preserve ownership would likely eliminate **further** mining opportunities. After further consideration, the Forest Preserve District of Will County has indicated that this property is not desirable as a possible mitigation parcel (see Section 5.5). Other undeveloped dolomite resources adjacent to the Des Plaines River Valley lie both east and west of the **preferred** alignment and will not be affected by FAP Route 340.

4.10 Water Quality and Water Resources

4.10.1 Groundwater Resources

FAP Route 340 is not expected to have any measurable effect on the total groundwater supply anywhere along the alignment. A slight reduction in recharge area will occur due to the actual area of the pavement; however, the effect is not measurable except in microscale since the soils in the area do not allow rapid recharge naturally.

Groundwater quality is not expected to receive any measurable effects due to FAP Route 340. Impacts to wells would be unlikely due to the distance from the highway, the silty soils and clay layers above the sand and gravel which prevent recharge, the controlled drainage pattern of the highway, and the dilution of the runoff; however, wells in close proximity to the highway (within 200 feet) which are shallow, improperly cased, or directly hydraulically connected to highway runoff, could show increased levels of deicing chemicals

Most wells in this area do not obtain water from shallow sand and gravel, but from dolomite bedrock. The City of Joliet does have **five** sand and gravel wells **located west of the preferred alignment** beginning approximately **800** feet from FAP Route 340. **Exhibit 3-3 depicts the location of the Joliet well field relative to the preferred alignment. All drainage from the roadway, embankments, and adjacent right-of-way areas will be collected and channeled through either ditches or storm sewers to detention basins and then discharged to Spring Creek. Since all drainage is controlled and directed to Spring Creek, no impact is expected on these wells.**

Within the project area there are natural water regimes that rely on groundwater either constantly or intermittently, such as springs, wetlands, and streams. FAP Route 340 is not expected to have a significant effect on their quantity or quality of groundwater.

The Illinois Groundwater Protection Act establishes setback zones for the location of potential sources, such as underground storage tanks and stockpiles of deicing chemicals. Setback zones should be considered in the siting of maintenance facilities and in the operation of dry wells. The maximum setback zone around a community water supply well was established to be 1,000 feet for protection of groundwater from such concentrated contamination sources.

The project will cause the abandonment of 10 wells that occur within 200 feet of FAP Route 340. The wells will be abandoned in accordance with Illinois Department of Public Health regulations.

4.10.2 Impacts to Surface Waters

Surface water impacts result from both construction and operation of the highway. FAP Route 340 will cross nine streams and their tributaries: the Illinois & Michigan Canal, the Chicago Sanitary and Ship Canal, the Des Plaines River, two tributaries of Hickory Creek, one tributary of Black Partridge Creek, Long Run, Fiddymont Creek, Fraction Run, and Spring Creek. Construction impacts relate to the stream crossings and the types of instream work (pier placement, bank shaping, haul roads). For those waterways not crossed, the proximity to the construction activities and the drainage patterns determine the kinds of impacts. Operating impacts result from traffic and maintenance activities.

4.10.2.1 Construction Impacts to Surface Waters

Typical construction activities associated with bridges, culverts, and roadway approaches involve grading, filling, and excavation. All of these activities increase the erosion potential due to the reduction in vegetative cover and increased impervious areas resulting from compaction of soils by heavy equipment. Structure placement in the streams may cause minimal increases in turbidity and sedimentation and temporarily alter downstream hydraulics and substrate conditions. The increases in turbidity and sedimentation may have minor, temporary impacts on downstream aquatic systems.

The potential result of increased sedimentation during construction is the covering of natural substrate thereby eliminating necessary habitat conditions for some species of fish or macroinvertebrates. The magnitude of the impact will vary according to site specific conditions, such as the type of crossing structure, bank profile, stream size, soil type, and stream substrate. For streams in the study area, specific impacts and their mitigation measures are described.

Six tributary crossings **were going to** utilize broken back culverts on watersheds ranging in size from 0.12 to 0.45 square miles. **[sentences deleted] The engineers for the Illinois State Toll Authority (ISTHA) have reevaluated the use of broken back culverts and found them to be unnecessary. Standard culverts will be used in place of the broken back culverts.** Following construction activity, stream dynamics will act to return the affected areas to their original states.

A 440-foot bridge will span a channelized section of Spring Creek and no piers will be placed within the stream. In this area no channel excavation or changes will occur. Therefore, the stream hydrology will not be impacted permanently. In-stream activities may involve construction of a

haul road using clean, coarse aggregate. Standard ISTHA culvert design and construction specifications will be utilized to assure the original slopes and elevations of stream beds are restored to protect the normal movement and migration of aquatic organisms. After use, the haul road will be removed, the aggregate will be disposed of at an upland site, and the banks of the stream will be shaped and rip rap will be added. Haul roads may be required at all of the stream crossings. Temporary impacts will be an increase in turbidity and sedimentation during in-stream work. The impacts in this channelized section should not reduce habitat for the southern redbelly dace and fantail darter and other aquatic species requiring clear waters. Erosion control measures during construction and placement of rip rap will be used to avoid sedimentation.

Fraction Run will be crossed with a box culvert. Construction of the culvert will involve in-stream work and additional fill around the structure. Downstream impacts during construction will be increased turbidity and sedimentation. Due to the intermittent nature of the stream, impacts may be evident only during and after precipitation events. Erosion control measures during construction will minimize the impacts downstream.

Fiddymment Creek is a steep-banked, intermittent stream with highly erodible soils in the area of the FAP Route 340 crossing. To minimize impacts, the stream will be crossed by a **130-foot** bridge. No piers will be placed in the stream and erosion control measures along the banks will avoid potential impacts due to erosion. A tributary to Fiddymment Creek west of the alignment and south of 151st Street will be directed to a ditch for crossing purposes. This channel change extends for 1,500 feet at the headwaters of the tributary. Ditch checks will be used to regulate flow in the ditch.

At Big Run Creek, a box culvert will be placed in the stream. Less than 0.1 acres of forested wetland (wetland site 18) and 5.2 acres of upland forest will be removed. Temporary impacts from in-stream construction activities may increase turbidity and sedimentation downstream.

Long Run is a perennial stream with a substrate of mud over gravel. The highway will cross Long Run and 135th Street on a 580 foot long bridge. No piers will be placed in the stream and erosion control measures will be implemented to minimize construction impacts due to increased turbidity and sedimentation downstream.

A bridge 6,600 feet long will span the Des Plaines River Valley crossing the Des Plaines River, Chicago Sanitary and Ship Canal, and Illinois & Michigan Canal. There will be no pier placements or other in-stream work in **[phrase deleted] either of the canals. However, the mainline bridge will require minor in-stream work along the banks of the Des Plaines River. Prior to construction of the mainline bridge, a low level bridge will be placed over the Des Plaines River. The purpose of the bridge is to allow construction equipment into the north floodplain area in order to construct the main bridge piers. [sentence deleted] Construction activities in the floodplain for this low level bridge will involve construction of a haul road using clean, coarse aggregate and piers placed in the Des Plaines River. This structure, including vertical clearances, will be similar to the Stephen Street bridge upstream near Lemont Road. Erosion control measures will be used to avoid sedimentation during construction. The haul road and the low**

level bridge will be left in place for future maintenance use and potential bikeway access to the Keepataw Forest Preserve.

4.10.2.2 Operational Impacts to Surface Waters

The operational impacts of FAP Route 340 include the accumulation of pollutants on highway surfaces, median areas and adjoining right-of-ways as a result of highway use, natural contributions and deposition of air pollution. These pollutants include solids, heavy metals (lead, zinc, and copper), oil and grease, and nutrients. The concentrations of these pollutants are highly variable by site and are affected by numerous factors such as traffic characteristics, climate, maintenance activities and adjacent land uses.

Highway runoff pollution may affect water quality of receiving waters through shock or acute loadings and through chronic effects from long term accumulation within the receiving waters. The significance of these impacts is very site specific, and will depend heavily on the highway receiving water characteristics. Recent research (Bertram and Kaster, 1982; Dupuis, et al, 1984; Dupuis and Kobriger, 1985) indicates few significant impacts for highways with less than 30,000 ADT. Potential impacts are generally short-term, localized acute loadings from temporary water quality degradation, with few, if any, chronic effects.

Since the estimated ADT for FAP Route 340 is 36,000, the potential for significant water quality impacts is low.

Black Partridge Creek

Black Partridge Creek is unique within the project area because it is supplied by numerous natural springs and has the characteristics of a cool, clear stream. The lower portion of the stream passes through the Black Partridge Nature Preserve. The seep springs and stream are one of the significant features of the preserve. FAP Route 340 does not cross the main channel of Black Partridge Creek; however, the edge of the right-of-way approaches to within 200 feet at the nearest point. Of the three intermittent tributaries forming Black Partridge Creek, one is directly crossed by the alignment. Direct watershed effects are associated with this culvert crossing; however, this represents less than 0.1 square miles of the 3.0 square mile drainage basin of Black Partridge Creek. **[sentence deleted]**

The water quality of the combined tributaries forming the headwaters of Black Partridge Creek already shows the impact of land use changes associated with commercial and residential development. Chloride concentrations during January, 1994 exceeded the water quality standard at this point; however, sampling sites located within Black Partridge Forest Preserve and downstream of Bluff Road reported chloride levels in compliance with the General Use Water Quality Standards for the same time periods. There are no water quality standards for sodium. No other parameter, such as the metals, showed an exceedance of these standards.

The Black Partridge Creek contains the mottled sculpin, a fish species uncommon to the Des Plaines River system. No toxicity information was available for this particular species; however, the mottled sculpin has been observed in the Black Partridge Creek under a variety of water quality conditions. Chloride concentrations have fluctuated from 70 mg/l to **341** mg/l in areas where the mottled sculpin has been observed. At these same locations the macroinvertebrate species collected are those typically found in a semi-polluted environment.

For all water quality parameters, except chlorides and total dissolved solids, no exceedances of water quality standards are expected to occur within that portion of the creek in the Nature Preserve.

To minimize impacts to Black Partridge Creek, one design change and one operating change were evaluated. First, FAP Route 340 was moved approximately 350 feet west of the recorded alignment. This reduced proximity of FAP Route 340 to Black Partridge Creek decreased potential salt transport. Second, during operation, surface runoff south of Davey Road will be collected, **detained**, and discharged [**phrase deleted**] outside of the Black Partridge Creek watershed. This eliminates 2.3 miles or 22 percent of anticipated highway runoff to Black Partridge Creek. The drainage collected will be directed to the west into a treatment pond and then into a tributary that discharges to the wetland and floodplain areas in the Keepataw Preserve.

4.10.2.3 Maintenance (Deicing Chemicals) Impacts

Deicing salt, along with plowing and sanding are seasonal tools for highway snow and ice control. Deicing salt produces important public mobility and safety benefits by rapidly and reliably providing more driveable and less hazardous road conditions during the winter months. The benefits are difficult to quantify but are widely acknowledged to be valuable to society (Transportation Research Board, 1991). It has also been widely acknowledged that deicing salt (sodium chloride) has many unintended side effects. These effects have been summarized in Jones and Jeffery (1992) and the Transportation Research Board, (1991). The only generalization that can be made on the basis of the literature is that road salt impacts tend to diminish rapidly with distance from the roadway. Deicing salt is applied to roadways to lower the freezing point of water and to free the snow and ice from the pavement. Salt is applied to roadways during and after snow and/or ice storms. Most of the salt used is plowed along with snow and ice to the shoulder and adjacent right-of-way. Salt moves through the environment as runoff, splash and spray. As the snow or ice melts, the salt moves through to the drainage facilities until it enters a stream as runoff or percolates into the soil profile. Salt is also transported by splash or spray generated by moving vehicles coming in contact with brine or slush. Studies (Frost, et al, 1981; Diment, et al, 1973; Lipka and Aulenbach, 1976; Sucoff, 1975) indicate that 60 to 80 percent of the salt runs off into the surface water, 15 to 35 percent occurs as splash, and up to 3 percent occurs as spray.

The Illinois State Toll Highway Authority (ISTHA) typically uses a dispensing rate of 350 pounds per maintenance cycle of deicing salt per lane mile. The amount of salt entering the environment depends on the number of storms per season (usually November through March) and the number of salting events per storm. Over a seven year period, the ISTHA's average application rate of deicing

salt on an annual basis is 33.1 tons per lane mile. This is the expected annual rate of deicing salt use for FAP Route 340.

Surface Runoff

Surface runoff is the primary mode of road salt removal (60 to 80 percent). Runoff from the roadway and adjacent right-of-way is directed to the highway drainage system (a series of ditches and detention basins) before outletting into a stream. Potential impacts of deicing salt from highway runoff include effects on stream water quality and aquatic biota.

In Illinois, the General Use Water Quality Standard for chloride is 500 mg/l. There is no standard for sodium. Based on the methodology of the U.S. Geological Survey (Huff and Huff, 1993) increases in chloride concentrations were projected for each stream. The results indicated that chloride concentrations would remain within the water quality standards at all stream crossings on an annual basis.

There have been many **laboratory** studies (summaries in **U.S. EPA, 1987 [references deleted]**) of salt (sodium chloride) on aquatic biota, including acute and chronic toxicity studies. **[word deleted] Field** studies indicate that salt does not have significant deleterious impacts on aquatic biota (fish, invertebrates, aquatic plants) in large or flowing bodies of water where dilution takes place quickly (Jones and Jeffrey, 1992). This will be the case within the FAP Route 340 project area.

Splash

Splash is the liquid brine consisting of larger salt solution drops which fall out near the roadway (Stensland, 1976). Splash lands directly on vehicles, soil, and vegetation though some of it ends up in the roadway drainage system and is transported away as runoff. Potential impacts caused by splash are to vegetation (trees, shrubs, and grasses), soils, and erosion.

Trees and other roadside vegetation can be injured by salt through changes in soil chemistry and from splash and spray on foliage and branches. The symptoms of salt injury are similar to those of drought: inhibited growth, browning and falling of leaves and needles, and sometimes dying limbs and premature plant death. Under extreme conditions, roadside vegetation can be exposed to salt as far as 500 feet from the roadway, although the impact is seldom significant beyond 100 feet. Tree damage is likely to be greatest along high-traffic highways with heavy salt use and steep side slopes. Approximately 5 to 10 percent of the roadside trees in forests located along heavily traveled highways exhibit signs of salt-related decline. Roadside shrubs, grasses, and wetland vegetation are generally more salt tolerant than trees (Transportation Research Board, 1991)

Salt impacts on soils are usually confined to 15 feet from the roadway, although greater distances have been reported. Long-term salt accumulation in soil increases soil density and diminishes permeability and fertility which may adversely affect moisture retention and soil structure characteristics that are important for plant growth and erosion control. The accumulation of salt in

soils depends on many factors including soil type, precipitation, and topography (Transportation Research Board, 1991).

Spray

Spray consists of fine droplets of salt in solution or particulates which are lifted by wind and moving traffic to varying heights and distances. These smaller droplets will evaporate to an equilibrium size consistent with the ambient relative humidity and be widely dispersed over the entire region (Stensland, 1976). This can be shown by the seasonal chloride concentration in precipitation in the Chicago area. Summer chloride concentrations average 1 mg/l while winter chloride concentrations average 4 mg/l. The 3 mg/l gain during winter may be attributable to deicing salts (Stensland, 1976).

The FAP Route 340 roadway will contribute to the winter regional salt levels in the atmosphere. However, salt concentration decreases rapidly with distance from the roadway and effects would be limited to potential impacts on salt sensitive trees as far as 500 feet from the roadway. These impacts are considered minor. Potential impacts to soil, surface waters including wetlands, and aquatic and terrestrial biota from salt spray are minimal.

Alternative Deicing Chemicals

An alternative deicer, calcium magnesium acetate (CMA) was considered for this project. In the selective and experimental situations in which it has been used, CMA has often performed acceptably, although not in the same manner and not quite as effectively or consistently as salt. Compared with salt, it is slower acting and less effective at temperatures below 23° F and in freezing rain, drier snowstorms, and light traffic. The timing of the application of CMA is more critical than that of salt. If application is delayed, its deicing performance is notably reduced. CMA is usually applied in greater quantities (by weight) than is salt (usually by 20 percent or more) though specific quantities vary by storm and use. CMA is priced between \$600 and \$700 per ton. The price of road salt (sodium chloride) averages \$30 per ton (Transportation Research Board, 1991).

With regards to environmental effects at concentrations likely to be generated by highway deicing, CMA is likely to be less environmentally damaging than salt except with regard to dissolved oxygen levels. CMA has the potential to reduce dissolved oxygen levels as it decomposes. Hence, heavy CMA treatment near small poorly flushed, or poorly diluted ponds, streams, and wetlands could cause adverse effects to aquatic organisms (Transportation Research Board, 1991).

Because deicing salt (sodium chloride) is reliable, inexpensive, and easy to handle, store, and apply, it will be used on the FAP Route 340 roadway.

4.10.2.4 Measures to Minimize

Design, construction, and operational features have been developed to minimize highway runoff on receiving streams. These include the use of vegetated drainage ditches, wet detention basins, erosion control features, and deicing control management.

Drainage from the right-of-way will be controlled and treated via a series of vegetated ditches, and dry and wet detention basins. Approximately **45** detention basins are planned and their locations are depicted on Exhibits 3-3 to 3-5. Each basin is sized for a release rate of 0.15 cfs/acre during a 100 year storm. For a two-year storm, the release rate is 0.04 cfs/acre. The purpose of the detention basins is to hold storm runoff and its associated pollutants (such as lead, zinc, and other particulates). The overall effect of a wet detention basin is that as water is displaced by inflows, the water leaving the basins is much cleaner. Though detention basins allow deicing salts to pass through because of their ionic nature, the effect is to lower the peak concentrations of deicing salt. However, deicing salt concentrations would remain at higher levels over a longer period of time until inflows flush out the system.

The ISTHA will follow its erosion control policy as well as the requirements of Section 402 and Section 404 of the Clean Water Act during road construction. Goals for erosion control include keeping disturbed areas small, protecting disturbed areas from runoff, retaining sediment within the site boundaries and making periodic checks to confirm that these practices are working.

Whereas salt is an effective snow and ice control tool, its limitations require careful management. Recognizing both the importance of highway deicing and the potential adverse side effects of salt, ISTHA has tried to control salt use without sacrificing deicing effectiveness. ISTHA has developed a snow removal and deicing application management system based upon obtaining site specific weather conditions and inventory control feedback. The use of a private weather system, their own weather radar system, and remote sensors stationed at critical locations to determine pavement conditions, provides information needed to optimize deicing applications. Inventory control techniques provide direct feedback regarding deicing operations during storm conditions.

4.10.3 Impacts to Wetlands

Of the **34** wetlands identified in the study area, **19** will be impacted by the preferred alignment. Some of those remaining may receive indirect impacts from the construction and operation of the highway. A total of **10.4** acres of wetlands will be directly lost due to filling activities. These wetlands include **6.4** to **6.6** acres of emergent wetland, **1.2** acres of forested wetland, **1.4** acres farmed wetland, **0.9** acres excavated wetland, and **0.3** acres of unconsolidated bottom wetland. Table 4-6 summarizes the area of direct, permanent wetland loss due to highway construction.

4.10.3.1 Construction Impacts to Wetlands

Construction impacts to wetlands include filling, vegetation removal, and drainage changes. The locations of wetlands in the project area are shown on Exhibits 3-3 to 3-5. Functional values impacted would be primarily related to sediment trapping, flood storage and wildlife habitat. The impacts are summarized in Table 4-6.

Wetland 1

Wetland 1 is a 1.0 acre palustrine, emergent, seasonally flooded (PEMC) marsh located south of U.S. Route 6 and west of Cedar Road. The wetland is surrounded by cropland. Sixty percent of the wetland lies within the **required** right-of-way. This entire wetland is considered lost and there will be a loss of all sediment and nutrient trapping and migrating waterfowl habitat functions.

Wetland 2

Wetland 2, a **0.8** acre site located west of Gougar Road and south of Bruce Road, is a drained or ditched, seasonally flooded, palustrine, emergent, farmed wetland (PEMCd). Approximately **13** percent of the wetland lies within the **required** right-of-way and will be filled. The sediment and nutrient trapping functions will be reduced.

Wetland 6

Wetland 6, located just north of 167th Street, is a 0.6 acre marsh with hydrologic connection to Wetland 9. This marsh, situated between Gougar Road and the preferred alignment, does not lie directly within the right-of-way; however, improvements to Gougar Road and the placement of a stormwater detention pond will in effect eliminate this wetland. To avoid functional and areal losses to Wetland 9, which is a more diverse wetland with higher natural quality, Wetland 6 will be replaced with a stormwater detention basin. This basin will have the same primary functional values (sediment and nutrient trapping) of Wetland 6.

Wetland 8

Wetland 8 is a 0.6 acre farmed wetland located east of Gougar Road and north of 167th Street. This is a farmed, temporarily flooded, palustrine, emergent wetland (PEMAf). At least half of this small wetland lies in the **required** right-of-way. Sediment and nutrient trapping functions will be lost with the filling of the wetland.

Wetland 9

Wetland 9 because of its high natural rating was avoided by the preferred alignment. Improvements to Gougar Road and 167th Street will create a loss of 0.3 acres in the 13.1 acre wetland. The higher quality portions of this wetland are further to the west and will not be impacted.

Wetland 10

Wetland 10 is a palustrine, emergent, seasonally flooded wetland (PEMC) located north of 163rd Street. The wetland covers 5.1 acres and is a low lying depression in an area surrounded by cultivated cropland and residential development. The drainage area associated with the wetland is approximately 32 acres. The wetland's functional uses include sediment trapping and providing waterfowl habitat. Typical water depth in the wetland is less than four inches. Only at the northwest corner is there a deeper depression where water depths would be greater than one foot when flooded. This area is approximately 15 to 20 feet in diameter.

The placement of fill will cause the loss of 0.1 acres of this wetland site. The vertical profile of the alignment has been raised to allow drainage patterns in the watershed to be maintained. Construction of the highway will result in the diversion of some runoff associated with cultivated fields. The area of the right-of-way in the watershed is approximately 4 acres or 12.5% of the watershed.

The impacts of reducing the volume of runoff to this wetland would be minor, mainly reducing the area and depth of seasonal flooding. No major changes would be expected regarding its functional uses for sediment trapping, retention, or waterfowl habitat. In general, flow diversion and loss of less than 0.1 acres from the wetland would not be expected to reduce functional values of waterfowl habitat or sediment trapping.

Wetland 12

Wetland 12, located north of 163rd Street, is a 1.1 acre palustrine, emergent, seasonally flooded (PEMC) wet meadow. A small portion of the wetland lies within the **required** right-of-way. No loss of functions (sediment and nutrient trapping) is anticipated.

Wetland 13

Wetland 13 is located north and south of 159th Street east of the **preferred** alignment. The wetland is 1.1 acres and has three sections (ponds). The wetland ponds are intermittently exposed with unconsolidated bottoms (PUBGx). Small portions of two of the sections lie within the **required** right-of-way and will be filled. The sediment and nutrient trapping functions will be partially lost. A total of 18 percent of the wetland will be filled.

Wetland 16

Wetland 16 is located west of Gougar Road and north of 159th Street, near Swimmin Valley Farm. The palustrine, emergent, semi-permanently flooded wetland with an unconsolidated bottom (PUBFx) is an excavated stock pond in an active horse pasture. The 0.5 acre wetland lies entirely within the **required** right-of-way. All the sediment and nutrient trapping functions will be lost.

**TABLE 4-6
SUMMARY OF WETLAND IMPACTS**

Wetland Number	Wetland Class	Total Wetland Area, Acres (b)	Wetland Loss, Acres (b) Percentage		Function(s) Lost
1	PEMC	1.0	1.0	100	Sediment trapping and waterfowl habitat
2	PEMCd	0.8	<0.1	13	Sediment trapping reduced
6	ND(PEMC)	0.6	0.6	100	None
8	PEMAf	0.6	0.6	100	Sediment and nutrient trapping
9	PEMC/PFO1C	13.1	0.3	2	None
10	PEMC	5.1	0.1	2	---
12	PEMC	1.1	<0.1	9	None
13	PUBG _x	1.1	0.2	18	Sediment trapping
16	PUBF _x	0.5	0.5	100	Sediment trapping
18	PFO1C	8.6	0.2	2	Capacity for flood storage and sediment trapping
23	ND(PFO/SS)	1.9	0.3	16	None
25	ND(PEM)	0.1	0.1	100	Sediment trapping
26	PUBG_x	0.5	0.2	40	Sediment trapping and waterfowl habitat
30	PEMC	0.9	0.1	11	Sediment trapping
33	PEMC	1.1	1.1	100	Flood storage and wildlife habitat
37	PUBF	0.3	0.3	100	Sediment trapping
41	PEMAf	0.8	0.8	100	Sediment trapping
43	PFO1C/PEM	101.7	3.4	3	Wildlife habitat and sediment trapping
44	PSS/PEM	<u>10.0</u>	<u>0.4</u>	<u>4</u>	Plant diversity
Total		149.8 (a)	10.4	7	

Note (a): Total wetland acres denotes size of affected wetlands only.

(b): Minor revisions to wetland areas have been made due to refinement of the wetland boundaries and highway geometrics.

Wetland 18

The floodplain forest adjacent to Wetland 17 is affected by the construction of the preferred alignment and 151st Street modifications. **Approximately 0.2 acres** will be filled and the area occurs across the southern edge and western tip of the wetland. The **8.6 acre** wetland provides wildlife habitat, sediment trapping and flood storage for the Big Run watershed. Approximately 23 trees will be removed from this wetland.

Minor functional losses would occur in terms of reduced flood storage and sediment trapping capacity. Any habitat losses are minimized by the shift in the preferred alignment to the edge of the wetland. With Wetland 17 remaining intact and edge loss only, habitat functions are not expected to be reduced.

Wetland 23

This 1.9 acre floodplain forest/wet shrubland is located just south of 143rd Street and occurs at the edge of the 143rd Street right-of-way. Approximately 0.1 acres of the wetland lies within the **required** right-of-way for 143rd Street. The actual wetland loss will depend upon the type of improvements to 143rd Street, with the maximum loss being 0.3 acres. The drainage area is less than 0.25 square miles for this wetland, bounded by 143rd Street and a tributary of Long Run. Reduction in the drainage area is associated with the ramp at 143rd Street. No functional changes are anticipated.

Wetland 25

Wetland 25 is a 0.1 acre sedge meadow just north of 143rd Street. Approximately half of this wetland lies within the required right-of-way for 143rd Street. The actual wetland loss will depend upon the type of improvements to 143rd Street, with a maximum loss of less than 0.1 acres. Sediment trapping functions will be lost.

Wetland 26

This 0.5 acre pond is located northwest of the intersection of 139th Street and Illinois Route 171. Approximately 0.2 acres of this wetland lies within the required right-of-way for the southbound exit ramp. Improvements for drainage will result in the loss of 0.2 acres. Functional losses of sediment trapping, flood storage, and waterfowl habitat are expected.

Wetland 30

Wetland 30 is a 0.9 acre marsh lying west of a private road, east of Smith Road and south of 127th Street. It is a palustrine, emergent, seasonally flooded wetland (PEMC) surrounded by cropland. **One-tenth of an acre lies within the required right-of-way and will be filled. Some functional loss (sediment and nutrient trapping) is expected with the minor filling that will be needed.**

Wetland 33

Wetland 33 is a 1.1 acre wet meadow located south of 127th Street and east of Smith Road. It is a seasonally flooded, palustrine, emergent wetland (PEMC). The wetland lies entirely within the **required** right-of-way. All the flood storage and wildlife habitat will be lost.

Wetland 37

Wetland 37 is a 0.3 acre partially-filled pond located north of Bluff Road and west of the Cook-Will County line. It is a palustrine, unconsolidated bottom, semi-permanently flooded pond in the Bluff Oaks Estates development. This pond will be replaced with a wet detention basin for drainage and runoff control. Flood storage and wildlife habitat functions will be created by development of the wet detention basin.

Wetland 41

Wetland 41 is a 0.8 acre wet meadow located southeast of I-55 and west of the Will-DuPage County line. The wetland is a farmed, palustrine, emergent, temporarily flooded (PEMAf) site. Most of the wetland lies within the **required** right-of-way. This entire wetland will be considered lost and there will be a loss of sediment and nutrient trapping functions.

Wetland 43

In order to construct the bridge, access to Wetland 43 will be required. A construction haul road will be utilized and will extend from Lemont Road via the Metropolitan Water Reclamation District gravel road to the project area (Exhibits 3-11 and 3-12). In order to get construction equipment across the Des Plaines River, a low level access bridge will be constructed. The haul road in Wetland 43 will utilize an old trail (nonwetland area) to minimize wetland loss. However, the haul road will convert from 0.3 acres (**concrete bridge alternate**) to 0.7 acres (**steel bridge alternate**) of marsh, wet shrubland and forested wetland. This conversion will be permanent as the haul road will be used later as a multi-use facility.

Both the steel and concrete bridge alternates will place seven piers and a portion of two other piers into Wetland 43. This will cause the loss of from 1.6 to 1.8 acres of mostly marsh **respectively**.

A detention pond ("stilling basin") will be constructed in Wetland 43 (Exhibit 3-11 and 3-12). The basin will collect drainage from the bridge. Approximately 0.9 acres of marsh will be converted to non-wetland.

Four new Commonwealth Edison high voltage transmission towers will be constructed two on each side of the bridge. The foundations upon which the towers are constructed will convert approximately 0.2 acres of marsh to non-wetlands.

The construction within Wetland 43 will cause the loss of **3.4** acres of wetland. **Included in the 3.4 acres are** the wetland losses under the bridge **which** are summarized in Table 4-7. Wetland areas under the bridge not converted by construction will remain. Because the bridge is approximately 70 feet high and traverses a north-south direction, no shading effects are expected under the bridge.

Table 4-7
Losses in Wetland 43 that Occur Under the Bridge

Cover Type	Permanent Loss under Bridge Type, ac		Total Wetland Area under Bridge, ac
	Steel	Concrete	
Marsh (A)	0.8	0.7	2.3
Wet shrubland (D)	0.3	0.4	1.1
Floodplain Forest (E)	0.7	0.6	3.2
Total Wetland	1.8	1.7	6.6

Wetland 44

South of the Des Plaines River and west of the alignment in Wetland 44, compensatory flood storage will be provided in a wetland area adjacent to the Centennial Trail. A total of 0.4 acres of **this wetland** will be permanently lost [words deleted] which includes 0.3 acres [words deleted] filled for berms to contain the flood storage [words deleted] and 0.1 acres [phrase deleted] utilized for bridge construction. No other changes are planned for this wetland area. Table 4-8 represents the **wetland** cover types and the losses located under the bridge [phrase deleted].

Table 4-8
Losses in Wetland 44 that Occur Under the Bridge

Cover Type	Permanent Loss under Bridge Type, ac		Total Wetland Area under Bridge, ac
	Steel	Concrete	
Marsh (A)	0.1	0.1	0.1
Wet shrubland (D)	0.0	0.0	0.0
Floodplain Forest (E)	0.0	0.0	0.0
Total Wetland	0.1	0.1	0.1

4.10.3.2 Operational Impacts to Wetlands

During operation of the roadway, there is a potential for water quality impacts on wetlands within or adjacent to the right-of-way. The impacts depend on the traffic volume and whether or not the area is receiving direct roadway runoff. Highway runoff is directed away from all wetland areas with the exception of Wetland 43.

Roadway drainage **will be routed** into Wetland 43 **[words deleted]** from several sources: the detention basin **[phrase deleted]** **located north of Bluff Road on the west side of the highway; ditch flows from 700 feet of bridge and approach pavement north of Bluff Road; [phrase deleted] overflows from drainage structures at the base of bridge piers located in and adjacent to Wetland 43;** and splash/spray **that goes over** the bridge parapets.

A wet detention basin located **on the west side of the highway and north of Bluff Road** will collect **all** roadway **drainage south of Davey Road to within 100 feet of the start of the bridge. Outflows from this basin will be routed through a ravine west of the alignment and into Wetland 43 (Exhibit 4-8). [sentences deleted]**

Drainage from the 600 feet of bridge and 100 feet of approach pavement located north of Bluff Road is carried in a swale along the east side of the highway south to Bluff Road. At Bluff Road, highway drainage will flow westward via a ditch to the ravine west of the alignment and thence into Wetland 43.

Runoff from the bridge will be controlled via piping that discharges to a detention basin labeled “energy stilling basin” as shown on Exhibit 3-11 and 3-12. The drainage system of the bridge will collect the first flush runoff at the scuppers and be directed to the detention basin via buried storm sewer. All runoff below the two-year storm will be collected in this manner. For storms above the two-year event, the runoff will exceed the capacity of the control structures at the base of each pier and will overflow into the adjacent wetland.

Splash and spray from the bridge may be transported into Wetland 43. Most of the splash and spray effects will occur during winter (November through March) and are due to maintenance activities associated with the use of deicing chemicals (road salt). The distribution of salt splash from the bridge will depend upon the particle sizes, salt application rates, and meteorological conditions. Areas of splash typically occur within 100 feet of the roadway (Hofstra, Hall, & Lumis, 1979).

The Des Plaines River bridge will have two features minimizing splash reaching the wetland. First, there will be a paved shoulder. This will provide an additional 12 feet for capture of splash on the bridge. Also, parapets at a height of 3.5 feet are designed on the bridge edges. These parapets will act as a barrier, reducing splash and increasing the capture of runoff. The remaining splash will reach portions of Wetland 43 adjacent to the bridge.

Assuming that the wetlands are completely-mixed, static systems without any flow through or turnover, the calculated chloride concentration would reflect the total salt loading in the volume of

water present. The area within first 100 feet from the bridge will receive salt splash; however, the expected concentration change is less than 40 mg/l.

Currently, the water quality in this area corresponds closely to that observed in the Des Plaines River. This is expected, since the marsh and floodplain forest are annually inundated. Chloride concentrations currently vary from 82.5 to 363 mg/l in the marsh areas. The plant, fish, and macroinvertebrate species in the wetland area currently tolerate these levels of chlorides. Under worst case conditions, a maximum of 40 mg/l of chloride within the wetland around the bridge should cause no adverse effects. The predicted change in water quality concentrations would fluctuate over time given the floodplain's seasonal inundation. For the months of January and February wetland water quality concentrations of chlorides would be the highest, and in March the Des Plaines River would control water quality in this area as shown in Exhibit 2-14B.

The aerosol portion of salt spray, which represents a small percentage of the total emissions, will exhibit a modified dispersion pattern. The bridge elevation will result in a wider distribution pattern of salt spray at lower concentrations. This spray, although estimated to occur at distances up to 500 feet, will result in water quality changes even smaller than that calculated near the bridge. Potential impacts on vegetation or aquatic biota would not be expected to occur.

4.10.3.3 Cumulative Impacts

The analysis of wetland impacts is limited to the areas covered by the four township area (DuPage, Homer, Lemont, and New Lenox). The area within these townships is becoming increasingly urbanized as evidenced by population increases. In Homer Township, the population grew from 6,686 in 1970 to 21,464 in 1990. This trend is expected to continue with population in 2010 projected at 30,808. The population of Homer Township is projected to increase 43.5 percent in the next 20 years. Exhibit 2-4 depicts the existing land use in the project area. When compared to Exhibit 2-5 Proposed Land Use, it can be seen that there will be a loss of the wetland resource to development. Other than Section 404 of the Clean Water Act and the Illinois Interagency Wetland Policy Act of 1989 (applies only to state projects), there is currently no other protection for wetlands lying outside the highway right-of-way.

Within the four township area, wetlands comprise approximately 5.2 percent of the total land; however, most of them are associated with the Des Plaines River and its tributaries. Palustrine emergent wetlands make up 57 percent of the wetlands (see Table 2-9). Losses over the years are attributed to agricultural conversion, flood control projects (channelization), transportation (Chicago Sanitary and Ship Canal), and residential development. Residential development has continued at a rapid pace, and, with this development, roads and infrastructure improvements are occurring. Continued conversion of all land types, including wetlands, is associated with this growth in residential population. For example, Wetland 10 **and Wetland 9** have been filled or **modified** as the result of residential development. Also, on 127th Street a new school will utilize a portion of Wetland sites 30, 31, and 32.

Most of the remaining significant wetlands within the four townships occur within the Des Plaines River Valley and are in public ownership. These wetlands are expected to provide valuable habitat and hydrological functions for the area. Those wetland areas in private ownership will be subject to the conversion pressures associated with residential growth and the associated infrastructure improvements. See Section 4.20 for a detailed discussion of developments in this area.

4.10.3.4 Avoidance Alternatives

There were no alignments that avoided all wetland impacts. The preferred alignment was chosen to minimize impacts to wetlands. The originally recorded centerline alignment filled approximately **14.1** acres of wetlands. An alternate alignment (N-2, M-2 and S-2) impacted **15.6** acres of wetland. A refinement of these alignments produced the preferred alignment, which fills approximately **10.4** acres of wetland. Further information on wetland avoidance is given in Section 3.3 of this document. See also Table 3-1.

4.10.3.5 Measures to Minimize

To minimize construction impacts, the ISTHA Standard Specification Section 107.23 will apply. These include temporary runoff diversions with sedimentation controls to be used to capture sediment laden runoff from the construction area. Mulch barriers, hay bales and silt filter fences may be used to capture additional overland flow leaving the construction area, that does not enter the runoff diversions.

Bridging wetlands 43 and 44 minimizes the area directly filled and reduces changes in hydrologic characteristics of the wetland. Drainage from the bridge will be directed via piping to a wet detention basin in the Des Plaines River Valley. Also, an old trail is being utilized to minimize the construction impacts and permanent loss of area in Wetland 43. Mitigation measures are also described in Section 4.23.3. Where practicable, no construction equipment maintenance will be allowed within the wetlands.

4.10.3.6 Wetland Compensation

The wetland mitigation for the project occur in three different areas. The first area will be along Spring Creek (Exhibit 4-7) and satisfies Section 404 of the Clean Water Act; the second area occurs within the Lockport Prairie Nature Preserve (Exhibit 4-7a) and satisfies agreements with the U.S. Fish and Wildlife Service and the Forest Preserve District of Will County; and the third area at a location determined by the Illinois Department of Natural Resources and satisfies the regulations issued under the Illinois Interagency Wetland Policy Act of 1989.

The first area satisfies Federal requirements through the Army Corps of Engineers (ACOE). Replacement wetlands for the 10.4 acres of wetlands that will be filled due to FAP Route 340 will be provided. The replacement ratio for emergent, farmed, excavated, and unconsolidated bottom wetlands will be 1.5 to 1.0. For forested wetlands, a replacement ratio of 2.0 to 1.0 will be

utilized. The following total wetland compensation requirement is based upon these replacement ratios:

Wetland Type	Wetland Loss, ac		Required Wetland Replacement, ac	
	Steel	Concrete	Steel	Concrete
Emergent, Farmed, etc.	9.2	9.0	13.8	13.5
Forested	1.2	1.2	2.4	2.4
Total	10.4	10.2	16.2	15.9

The range in wetland losses and replacement listed above is associated with different pier placements between the steel and concrete bridge alternatives and includes impacts related to the entire alignment. The environmental analysis is based on a conservative approach using the **steel** bridge alternative. Thus, for the unavoidable wetland loss of **10.4** acres, a **minimum** wetland replacement of **16.2** acres is **required** and **16.5** acres are **actually** planned. **An area along Spring Creek will be used to compensate for wetland impacts (See Exhibit 4-7). The Spring Creek site is in close proximity to the highway facility.**

The 16.5 acre mitigation area within the Spring Creek floodplain will replace the function and value of the 10.4 acres of impacted wetlands. It is anticipated there will be overbank inundation providing opportunities for emergent vegetation. Specifically, the site will include a large flat area at the normal pool level within which wet prairie/emergent vegetation will be installed. In addition, a gently sloping area below the normal water level will be created for emergent vegetation. Slightly higher areas will be constructed to provide habitat for wetland forest and shrub species. A buffer of mesic prairie will be seeded along the uphill edges of the wetland creation areas. Directly adjacent or downhill of the mesic prairie, biofilters will be constructed to provide biological filtration of the stormwater sheet flow from adjacent uplands. Smaller open water areas are designed to provide a mosaic of habitats within the wetland mitigation area. The wetlands will be managed for desirable wetland species which will include removal of nuisance species.

ISTHA will transfer to the FPDWC, in fee, that property acquired and developed by the ISTHA for wetland mitigation at the Spring Creek site. For proper access, long term management and recreational trail development of the recommended Spring Creek wetland mitigation site, ISTHA will incorporate into the design of this wetland mitigation site an approximate 100 foot border.

The second area for the wetland mitigation has been requested by the U.S. Fish and Wildlife Service (FWS). The request is based on the impact to Wetland 43, a dolomite wetland (See Section 4.10.3.1). The FWS desires that the mitigation for this wetland occur within the lower Des Plaines River Valley and be designated as “in-kind” mitigation. The valley in this area supports unique biological communities formed from the interaction of groundwater and the underlying limestone formations. These communities include dolomite prairies which contain threatened and endangered plant and animal species. IDOT and ISTHA will

honor this request by restoring the hydrology in Lockport Prairie Nature Preserve as recommended by FWS and the Forest Preserve of Will County (FPDWC).

The mitigation site is located in the Des Plaines River Valley within the Lockport Prairie Nature Preserve (See Exhibit 4-7a). Specifically, historic drainage patterns will be restored to this prairie by mapping and measuring seep discharges, locating new culverts under the railroad embankment and removing berms that currently direct and concentrate the discharges. The goal is to provide more diffuse flow through a larger area of the prairie/wetland thus enhancing and restoring wetland vegetation. The recommended actions may increase breeding habitat for the Hine's emerald dragonfly east of the railroad tracks and enhance the existing breeding habitat for the Hine's emerald dragonfly and spotted turtle. The work also includes beaver management and brush management, and any construction is limited as to when it can occur by the Hine's emerald dragonfly breeding season (July).

The restoration area of the Lockport Prairie site is approximately 15 acres; however, only 25 percent would be credited for enhancement, approximately 3.75 acres. Coordination has been completed with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Illinois Nature Preserves Commission, and Forest Preserve District of Will County (FPDWC) for the development of the mitigation site concepts. The FPDWC will assume responsibility for maintenance of the new culverts at the Lockport Prairie Nature Preserve site once they are installed.

The third area of the wetland mitigation for FAP Route 340 relates to state level regulations. An agreement with IDNR, IDOT, and ISTHA has been made to follow the draft Administrative Rules for the Interagency Wetland Policy Act published October 2, 1995 in the Illinois Register. The updated ratios range from 1.5 to 5.5 to 1.0, depending on the wetland type. Using the updated ratios, the total area required to compensate for wetland impacts is 36.35 acres. IDOT and ISTHA are providing 16.5 acres at the Spring Creek site and 3.75 acres at the Lockport Prairie Nature Preserve. Therefore, the remaining 16.1 acres of wetland mitigation will be provided at an off-site location that will be selected in cooperation with IDNR. This location has not been determined as of the publication of this report. This location will meet all Federal and State requirements.

4.10.4 Floodplains

The **recommended** project has been reviewed in accordance with Executive Order 11988. "Floodplain Management"; Section 6-261, "Floodplains"; as contained in the Illinois Department of Transportation, Bureau of Location and Environmental (BLE) Manual of Policies and Procedures (Volume 1); and BLE Procedural Memorandum No. 2-80; and Title 92 Illinois Administrative Code, "Floodway Construction in Northeastern Illinois". The **recommended** action involves the construction of a new facility (FAP Route 340) as a divided highway with embankment and stream crossings and also involves improvements to crossroads.

Hydraulic Reports were prepared to evaluate each stream crossing in the project area to identify receptors, impacts and possible risks. All stream crossings with tributary areas over one square mile were designed not to increase the 100-year floodwater surface elevation more than 0.1 foot above the existing conditions at the upstream project right-of-way. This was done to comply with the floodway law for designated floodways and to allow later designation of additional floodways. The size and type of crossing has been recommended in each Hydraulic Report. All floodplain encroachments were transverse; there were no longitudinal floodplain encroachments. Each floodplain encroachment was evaluated.

The impacts of construction activities and **recommended** improvements on natural and beneficial floodplain values were evaluated. Compensatory storage of 5 to 8 acre-feet is being provided for **recommended** fill in the floodplain and regulated floodway of the Des Plaines River. This fill is associated with the low level bridge embankment, the haul road embankment, the berms at the pier embankment and the pier shafts supporting the bridge. Storage to detain increased runoff from the improvement will be located south of the Des Plaines River in an open water area of Wetland 44 and will be designed to permit floodwaters to back up into these facilities to maintain adequate conveyance for the 100-year flood.

The **recommended** highway will:

- Result in minimal increase in flood heights and flood limits.
- Not result in any adverse impacts on natural and beneficial floodplain values.
- Not result in an adverse change in flood risks or damage.
- Not support incompatible base floodplain development.
- Not cause potential for adverse interruption or termination of emergency service or emergency evacuation routes.

Therefore, it has been determined that these potential transverse floodplain encroachments are not significant.

The **recommended** improvements, activities, and mitigation measures are in compliance with state and federal laws. Preliminary evaluation indicated that the **recommended** actions will not require a revision to the regulatory floodway outside of the project right-of-way. However, coordination with **Illinois Department of Natural Resources (IDNR) - Office of Water Resources** and possibly the Federal Emergency Management Agency will continue as design plans become available to minimize the impact to floodway boundaries within the **required** highway right-of-way.

4.10.5 Impacts to Seeps

Seeps along Black Partridge Creek within the Black Partridge Nature Preserve have been described in Section 2.11.5. The preferred alignment avoids the Nature Preserve and seep area. Because the seeps are the result of groundwater discharge, potential changes in groundwater patterns were investigated. A study by the Illinois State Geological Survey (ISGS, 1991) included a hydrogeological characterization of the seep and development of a model to predict the impacts. Several design scenarios and two highway alignments were evaluated to predict the reduction in discharge volume associated with highway construction. The eastern alignment alternative represented the recorded centerline and would have resulted in a potential maximum reduction of 35 percent. The western alignment alternative represents the **recommended** design.

Twelve possible scenarios were analyzed using different design assumptions ranging from diversion of all highway runoff out of the watershed to allowing for some runoff infiltration through grassed ditches. The range of seep discharge reduction varied from 7 to 26 percent under steady-state conditions. The most likely discharge reduction would be 13 to 18 percent utilizing the factors considered to be feasible as design detail. As the water table rises, the seep will flow, and when the water table drops, flow to the seep also will decline. According to this study, there will be little change in the peak discharges from the springs at Black Partridge Creek. Periods of no discharge will be extended by a few days. This reduction in discharge frequency is not expected to alter the seep area in size or in quality.

Additional analysis was completed by the Illinois State Geological Survey regarding the impact of deicing chemicals. According to the Illinois State Geological Survey, travel time through the aquifer is calculated as 30 to 50 years. Chlorides reaching the seep during that time period will be diluted by groundwater so that a possible increase of 5 to 10 mg/l may occur. Since current seep chloride concentrations are 38 mg/l to 111 mg/l, no adverse impacts to the aquatic biota are expected. Other pollutants, such as oil and grease, will be degraded and should not reach the seep.

4.10.6 Permits

There are permit requirements for construction of the preferred alignment. These permits are associated with the crossing and filling of water resources including wetlands. Since the FAP Route 340 project will be constructed as a whole, the Army Corps of Engineers require an Individual Permit application to cover the entire project. In addition, a Section 401 water quality certification will have to be obtained from the Illinois Environmental Protection Agency.

The project will result in the disturbance of five or more acres of total land area. Accordingly, it is subject to the requirement for a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from construction sites in accordance with Section 402(p) of the Federal Clean Water Act as amended. Permit coverage for the project will be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit No. ILR100000), or under an individual NPDES permit. Requirements applicable to such a permit will be followed, including the preparation of a Stormwater Pollution Prevention Plan. Such plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the construction site and shall describe and ensure the

implementation of practices which will be used to reduce the pollutants in discharges associated with construction site activity and to assure compliance with the terms of the permit.

Floodway permits will be required for Spring Creek and the Des Plaines River since these are regulated floodways. These floodway permits will be processed by **IDNR Office** of Water Resources. In addition, a U.S. Coast Guard permit is required for the crossing of the Chicago Sanitary and Ship Canal as a "navigable water of the United States." Correspondence with the U.S. Coast Guard (November 2, 1988, September 22, 1988) has identified the jurisdiction and clearance requirements for the Chicago Sanitary and Ship Canal. Minimum horizontal and vertical navigational clearances will be maintained to assure that there will be no navigational impacts. **Meeting minutes from May 5, 1995 discuss the requirements and time frame associated with obtaining a permit from the U.S. Coast Guard for the Des Plaines River Valley Bridge crossing of the Chicago Sanitary and Ship Canal. An application for a U.S. Coast Guard permit has been made by ISTHA subsequent to that meeting.**

4.11 Biological Resources

4.11.1 Vegetation and Cover Types

Biological impacts associated with the highway construction and operation are loss, degradation, or modification of terrestrial habitat. Direct impact areas include the highway, six interchanges, and one mainline toll plaza. Agricultural land represents approximately 69 percent of the directly impacted area. The following cover types each comprised less than 10 percent within the right-of-way: upland forest, shrubland, forbland, wetlands, grasslands, and streams. The impacts upon each of these cover types is described within the following sections. Table 4-9 summarizes the direct impact areas by cover type for the preferred alignment compared to the total acreage within the project area.

Removal of approximately 1,004 acres of various cover types occurs with construction of the alignment. These cover types will be converted from present use to either pavement or grassland as a result of highway construction.

4.11.1.1 Construction Impacts

Agricultural Lands

Over half of the area directly taken by the preferred alignment is agricultural lands; however, substantial segments of cropland remain intact for habitat purposes. Animals that inhabit agricultural lands are mostly generalists and are adaptable to disturbance. The project will not cause a significant impact on these generalist type species.

Uplands, Shrublands, and Forblands

The second largest percentage of area directly taken (17%) consists of upland forests, shrublands, and forblands. The preferred alignment removes forested areas from fragmented tracts of upland forest and shrubland. In the southern area, there are no upland forest areas associated with the alignment.

Table 4-9
Direct Impact Areas on Cover Types

Cover Type	Total Acreage in Project Area ^{a/}	Total Acreage Directly Impacted
Agricultural ^{b/}	4,151	696
Streams and Canals ^{c/}	100	11
Wetlands ^{d/}	578	9
Upland forest ^{e/}	1,111	72
Shrubland, forbland	1,335	92
Grasslands and savanna	212	19
Developed	2,200	105
Totals	9,687	1,004

a/ Areas within 0.6 miles of FAP Route 340 b/ Includes cropland, hayfield, and pasture

c/ Area bridged by highway

d/ Wetland Impact areas defined as those areas permanently lost

e/ Includes tree plantations

Forbland and shrubland represent successional stages of old fields or pastures. Of the 622 acres of forbland in the study area, 48.4 acres will be taken by the preferred alignment. An early successional old field located near Illinois Route 7 will be crossed by the preferred alignment. This forbland is adjacent to agricultural, forested, and residential areas.

There are five areas of forbland within the middle portion of FAP Route 340. The largest tract of forbland is 25 acres, and the other four tracts are 14, 6, 5, and 2 acres. These tracts are usually adjacent to forested and agricultural areas. The **preferred** alignment crosses the forbland at two locations. Fourteen acres of forbland adjacent to the Big Run tributary will be reduced to 11 acres. South of 143rd Street, the 25 acres of forbland will be cut into two sections of 4.5 acres on the east side and 9.5 acres on the west side. The total loss from this area will be 11 acres as a result of the alignment.

Upland forests are highly fragmented throughout the project area. The preferred alignment will take 72 acres of forested area from large tracts in the central and northern sections of the project for

a total estimated tree loss of 16,500. The following forested tracts represent the largest losses associated with the preferred alignment.

Just north of 151st Street is a 98-acre forested tract that will be divided on the eastern side, creating additional forested edge. A 2.4 acre section will remain east of the alignment. Approximately 2,180 trees in 4.6 acres would be lost from this area. North of 143rd Street, there is a 44-acre tract which includes two acres of pine plantation. This tract will be divided by the alignment resulting in the loss of 4,700 trees in 18.8 acres.

Approximately 22.5 acres of forest, or 5,630 trees, will be taken from a 50-acre forested area south of 127th Street. This 50-acre tract is already divided into two approximately equal-sized tracts by a Commonwealth Edison right-of-way. The decrease in size further reduces the quality of this area as habitat.

Over 18 acres of a 100-acre tract south of New Avenue will be taken. The tract will be divided into two pieces with five acres remaining west of the alignment and a larger segment intact to the east. Approximately 2,820 trees would be lost from this area.

The most significant forested tract to be directly impacted consists of several hundred acres of dry mesic and mesic upland forest on either side of Bluff Road. This tract lies mostly north of Bluff Road and will be divided by the right-of-way into two approximately equal portions of over 150 acres each. (A developer has already clear cut several acres of forest in the vicinity of the right-of-way. The construction of FAP Route 340 would maintain this division, but without the highway the area would become a residential subdivision).

East of the alignment, over 180 acres of forest lying in the Lemont Woods (**Wood Ridge**) Forest Preserve and Black Partridge Woods Nature Preserve will be avoided. West of the alignment, the forested land lies on private property and is partially fragmented by residential lots and driveways.

South of Bluff Road, the upland forest lies within the Black Partridge Forest Preserve and Keepataw Forest Preserve. The right-of-way will require 1.8 acres from the portion within the Keepataw Forest Preserve.

The forests in the area are already highly fragmented, and the project will increase their fragmentation. Additional forest edge will be created and species sensitive to fragmentation may be disturbed by the spread of disturbance-adapted species.

Des Plaines River Valley

The area north of New Lemont Road and south of Bluff Road in the Des Plaines River Valley contains some of the most diverse, yet fragmented, high-quality community types in the project area. The majority of the fens, seeps, and areas with plant diversity lie north of the Des Plaines River. South of the river to New Lemont Road is a highly industrialized area with former and

existing quarrying sites. There are six main cover types in the valley within 1,000 feet of the **preferred** alignment. These cover types were previously discussed in Section 2.12.1.

South of Bluff Road the valley will be bridged. Two different bridge types, concrete and steel, have been designed for the valley crossing. The cover type impacts associated with these two alternative bridge designs are very similar. Impacts to the marsh, wet shrubland, and floodplain forest are discussed in Section 4.10.3 under Wetland 43. Impacts to the shrubland and upland forests would be the loss of vegetation and trees during bridge and haul road construction. When construction is completed, these areas, except at the piers and along the haul road, would be restored with vegetation. A total of 2.1 acres of shrubland will be permanently lost for both bridge types. For the steel bridge, 0.61 acres of upland forest will be lost versus 0.57 acres for the concrete bridge. Approximately 21 per cent of the shrubland and 3 per cent of the upland forest characterized in the valley area would be covered by the bridge. Exhibits 3-11 and 3-12 show the areas to be impacted.

Shrubland occurs in three sections (F4 along Bluff Road and in F1, two small patches just north of the Commonwealth Edison utility line). Approximately 0.4 acres along Bluff Road (F4) would be permanently lost at the western edge. The two small shrubland patches north of the utility line (F1) total less than 0.2 acres and would be considered as permanent losses. Construction impacts would eliminate both patches. Additional area south of the Des Plaines River, which was originally wetland but has since been delineated as non-wetland area, also is taken as a loss.

The 0.6 acres of upland forest area impacted (G2) is composed of regrowth forest on areas of spoil from past limestone quarrying. Weedy herbaceous species are abundant in the understory. Only the extreme western edge of these areas will be cleared or covered by the project. Approximately 0.95 acres of upland forest (G2) between the Des Plaines River and the Chicago Sanitary and Ship Canal would be covered by the bridge. At this location, the bridge height would be from 70 to 80 feet above the valley floor thus allowing some room for tree growth beneath and adjacent to the bridge.

The haul road for access to construct the bridge and utility tower replacements would begin on the south shore of the Des Plaines River along an existing gravel road used by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). A low level bridge would be constructed over the Des Plaines River and the haul road would continue in a northerly direction along the west edge of the right-of-way. North of the Commonwealth Edison utility lines, the haul road would cross under the main bridge to the east side and continue north to the last pier before the edge of the bluff.

The haul road would traverse through marsh, wet shrubland, and floodplain forest from south to north, respectively. After construction the haul road **and low level bridge** will remain in place for **inspection and** maintenance access to the bridge. **ISTHA will give the haul road and low level bridge to the [phrase deleted]** Forest Preserve District of Will County for recreational purposes and as a link to the Centennial Trail along the south bank of the Des Plaines River. Leaving the haul road in place will result in the permanent loss of 0.3 to 0.5 acres of wetlands including marsh,

wet shrubland, and floodplain forest. A total of 5.8 acres of all cover types will be permanently lost due to the bridge and haul road.

4.11.1.2 Operational Impacts on Vegetation

Cover types found in the FAP Route 340 project area include agricultural areas, grasslands, shrubland, and upland forest. Since runoff will be collected throughout the paved and unpaved areas, salt splash and salt spray are the only direct effects to be considered. Splash will be minimized by the design of grassed swales in the right-of-way.

Agricultural fields include corn, soybeans, and other grains or forage crops. Corn and soybeans are planted seasonally and will not directly be affected by deicing. Indirect effects are possible in the zone adjacent to the right-of-way where soil concentrations of sodium and chloride could increase. These zones are typically limited to 150 feet from pavement or approximately 50 feet beyond the right-of-way. There is not likely to be an impact since grasses and legumes are less sensitive than woody plants (Hanes et al., 1970).

Grasses have moderate to good salt tolerance with the exception of several clover species (Carpenter, 1970). The grasses appear in limited areas adjacent to the FAP Route 340 right-of-way. Only areas where sodium and chloride concentrations accumulate in soils are there potential changes in the species diversity. Tolerant and moderately tolerant species will not be affected; however, there is a potential impact for species with low salt tolerance and located in close proximity to the right-of-way.

Upland forest tracts appear throughout the FAP Route 340 project area. These tracts consist of densely vegetated areas near 151st Street, north of 143rd Street, south of 127th Street, and south of New Avenue. The Black Partridge Nature Preserve and Keepataw Forest Preserve also represent tracts of dry-mesic and mesic upland forest adjacent to FAP Route 340 roadway.

Since Black Partridge Nature Preserve is the highest quality area, additional subcanopy species have been evaluated. Many of the dominant species show tolerance of salt with the exception of basswood trees and sugar maple showing moderate to poor tolerance. In the subcanopy, the black cherry, grey dogwood, and frosted hawthorn were identified with poor tolerance. The tolerance ratings are based upon the observed effects of salt upon these species.

The potential impact upon these areas is determined by the tolerance of individual woody species and the magnitude and extent of salt spray transport. Salt transport is a function of traffic volume, speed, and site characteristics. Sucoff's (1975) evaluation of probable damage by distance utilized traffic volume and salt tolerance. Since distances from pavement were used in the Sucoff (1975) assessment, the unpaved area of the right-of-way was considered to extend 80 feet from pavement.

For susceptible or sensitive species outside the right-of-way, some damage may occur 65 feet to 150 feet from pavement. Beyond 150 feet from the roadway, a medium low amount of damage

may occur. Again, tree size, health, and location within the forested area will affect the amount of damage.

FAP Route 340 would be located adjacent to the Black Partridge Nature Preserve with a buffer zone separating the right-of-way from the preserve. This buffer zone is 150 feet from the right-of-way at the narrowest point and 300 feet from the right-of-way at the widest; however, edge of pavement will actually result in an additional 88 feet of buffer. Therefore, there is a buffer zone of 238 feet to 388 feet between FAP Route 340 and Black Partridge Nature Preserve. This buffer zone provides protection of preserve areas from the highest potential zone of deposition because of both distance and the thickness of the vegetation. As noted by Dirr (1976), the thickness of the vegetation reduces penetration. The buffer zone is populated by upland trees that will screen the Nature Preserve area from a portion of the aerial salt spray. Because salt spray deposition decreases with distance, the potential impacts are also reduced with distance.

4.11.1.3 Landscape Restoration

All areas disturbed by construction will be restored in accordance with a landscape restoration plan.

The landscape restoration plan to be developed will include the following components:

- Tree replacement at a 1:1 ratio utilizing native tree species larger than seedlings.
- Tree replacement at a 3:1 ratio utilizing native tree seedlings.
- Right-of-way adjacent to forested areas impacted will be replanted utilizing native trees and plantings in mass to bring forest out onto **the tops of slopes and backslopes of the** right-of-way.
- The restoration plan for areas adjacent to sensitive areas will be designed with input from the forest preserve districts.
- A native grass and wildflower component.

Protection and care will be provided for all existing trees and shrubs to remain within the project limits as referenced in Illinois Department of Transportation's "Special Provision for Protection and Care of Trees and Shrubs", which will be included in the job specifications. Existing trees and shrubs which are to remain will also be delineated on the plans as will those which are to be removed.

4.11.2 Impacts to Wildlife

Reductions in cover type areas can impact wildlife if alternative habitat is not readily available or if fragmentation results in an advantage to competing wildlife species. As described in Section 4.11.1, the project will result in an increase in fragmentation by dividing and removing parts of contiguous habitat areas; however, habitats will still remain for most species. The most important

habitat areas for wildlife are in the Des Plaines River Valley and north of Bluff Road in the Black Partridge Nature Preserve.

Wildlife corridors are a part of the habitat and species support structure. Different classes of species utilize and depend on corridors to different degrees, so this discussion will focus on corridors according to species type.

Birds

Wildlife corridors are used by birds in northern Illinois in two ways: as part of a migratory trip or as part of a foraging trip originating from a breeding site. FAP Route 340 is not anticipated to impact any migratory corridors, although migrants may use the marsh areas along the Des Plaines River for foraging during the trip. The only breeding sites that could be associated with FAP Route 340 are at Goose Lake and Lake Renwick. The herons from these rookeries are likely to forage in the vicinity of the highway, however, due to the height of the bridge spanning the wetlands (approximately 70 feet), impacts are not anticipated. These birds already cross major bridges and roads to reach foraging and colony areas.

Mammals

Corridors for mammals typically are associated with linkage of significant habitat areas and large mammals. An example might be elk migration between summer and winter ranges. Other than in the Des Plaines River Valley, significant mammal habitats are not present in the corridor, nor do any mass migrations occur. Mammals in the project area include deer, furbearers, and small mammals. Deer and furbearers would be expected to move between the wetland complexes and cover types in the Des Plaines River Valley. The bridge spanning the valley is not expected to restrict these movements. North of Bluff Road, additional spans to the main bridge have been added specifically to allow the passage of animals.

South of the Des Plaines River Valley, much of the mammal movement would be expected to follow streams. Access control fencing might restrict the movement of deer and small mammals across the facility. Bridges will be constructed to span the floodplains of the perennial streams that cross the alignment such as Spring Creek, Fiddymont Creek, and Long Run. Large culverts will be constructed to accommodate seasonal streams such as Big Run and Fraction Run. Access control fencing is recommended to tie into the bridge abutments and culvert headwalls rather than span across the streams. This fencing treatment will allow mammals to cross **under** the highway and be protected from the vehicles moving at high speeds. Access to the stream within the highway right-of-way would still be allowed. This initiative will minimize the effects to mammal movements across the corridor.

Smaller mammals such as voles and shrews may be inhibited from crossing multi-lane pavements (Adams and Geis, 1981). Therefore, existing routes such as Lemont Road, Gougar Road, Archer Avenue and Bluff Road already may inhibit small mammal movements between cover types.

Reptiles and Amphibians

Corridors that reptiles and amphibians might use are more related to wetlands, streams, and bodies of water. In fact, streams could be considered both a corridor and a destination. As virtually all drainage channels or streams will be bridged or culverted, existing corridors will be preserved. Culverts where the slopes might be considered too steep for reptile and amphibian movement will have scoring on the concrete to give better traction. The only location where reptile and amphibian movement might occur transverse to a stream or culvert would be in the wetland complex north of the Des Plaines River. Since this area will be bridged, no impacts are anticipated.

4.11.2.1 Birds

Forest Dwelling Birds in Upland Sites

The preferred alignment of FAP Route 340 further divides the upland forest west of Black Partridge Nature Preserve; however, no areas of the Preserve will be taken. Increased fragmentation may adversely affect 4 species of forest interior birds during breeding season that are highly sensitive to fragmentation, as well as several others that are moderately or less sensitive. These 4 species were the wood thrush, red-eyed vireo, yellow-throated vireo, and scarlet tanager. All 4 are considered highly vulnerable to cowbird parasitism, as well as being highly or moderately vulnerable to nest predation, area reduction, and/or disturbance (e.g. grazing). Although scarlet tanagers were observed feeding young, it is not known if the other 3 species were nesting, and if nesting, if they were successfully breeding. The wide distribution of brown-headed cowbirds in the upland forest makes it likely that the wood thrush and red-eyed vireo were not successfully breeding there. Cowbirds were not observed during breeding season in the bottomland forest but cowbirds are not normally associated with bottomland forest. It is possible that wood thrush, yellow-throated vireo, and red-eyed vireo could breed successfully there but the fragmented bottomland forests would make these birds more susceptible to nest predation.

Forest Dwelling Birds in the Des Plaines River Valley

Migrant species that utilize forested fragments in the valley are already suffering from predation and nest parasitism. The preferred alignment will mostly skirt these areas and bridging through the Des Plaines River Valley over the canopy at a height of about 80 feet, and the 3.2 acres of forest impacted should not significantly increase impacts to neotropical migrants.

Colonial Birds

The aggregate wetlands of the Des Plaines River Valley contain the most important habitat areas for birds in the project area. For discussion of habitat impacts in these areas, see Sections 4.11.1 and 4.10.3. Using the observation reports of Malmborg (1990), reduced habitat area will not affect the foraging activities of the wetland birds and waterfowl in the project area. The number of foraging locations observed for heron in the right-of-way of the preferred alignment and haul road was 5 of the 102 total locations reported (Malmborg, 1990) or 5 percent of the locations in the Des Plaines

River Valley. Waterfowl were observed foraging in 56 locations, and four of these locations, or 7 percent, are adjacent to or along the preferred alignment. Other species observed included state-endangered osprey, state-threatened pied billed grebe, king rail, and common moorhen, and the uncommon sora and Virginia rails. These species were observed foraging at 34 locations, only two of which are located in the alignment. Neither the state-endangered species or state-threatened species were observed at the two locations along the alignment. 2.5 acres of foraging habitat will be taken as a result of bridge piers/berms, the energy stilling basin and haul road construction.

4.11.2.2 Mammals

Furbearers and mammals in the project area will not be significantly impacted. Deer populations along the north side of the Des Plaines River Valley will not be impacted since a bridge across the area will allow continued movement within the Black Partridge and Keepataw areas.

4.11.2.3 Reptiles and Amphibians

Reptiles and amphibians were found in seven wetlands: Wetlands 6, 9, 28, 30, 31, 32, and 43. Suitable habitat for reptiles and amphibians should remain and there will be little impact on these species.

4.11.3 Threatened and Endangered Species

The federal- and state-listed threatened and endangered species expected to occur in the project area were discussed in Section 2.12.3. The following discussion is limited to the potential for impact on these species. **The FAP Route 340 project [phrase deleted] was coordinated with the U.S. Fish and Wildlife Service (FWS) under Section 7 of the Federal Endangered Species Act (1973, as amended) and with the Illinois Department of Natural Resources (IDNR) under the Illinois Endangered Species Protection Act.**

4.11.3.1 Federally-listed Species

Leafy Prairie Clover (*Dalea foliosa*)

Because the leafy prairie clover occurs greater than 3,000 feet west of the FAP Route 340 alignment the project will have no adverse impact on this species.

Hine's Emerald Dragonfly (*Somatochlora hineana*)

The Hine's emerald dragonfly is a recently listed (January 25, 1995 in the Federal Register) endangered species as well as a state listed endangered species. [sentence deleted] The habitat through which the FAP Route 340 alignment passes has been severely altered by quarry activity, the Chicago Sanitary and Ship Canal modifying the hydrology, and by beaver activity. These factors have affected the marshes' suitability as breeding habitat. The areas that will be disturbed by FAP Route 340 are presently unsuitable as breeding habitat. It is [phrase deleted] **likely that this** area serves as foraging habitat. The important breeding sites, such as at Lockport Prairie Nature Preserve located 6.5 miles southwest of the project crossing of the Des Plaines River, are already protected. No breeding areas are impacted by this project.

[sentence deleted] Fragmentation of foraging habitat is a concern cited by Cashatt (1992). Studies are **being done that include** [words deleted] dragonfly observations within the FAP Route 340 corridor. [phrase deleted] Fragmentation of habitat is reduced by the fact that the road is built on structure and the only loss from the bridge is the pier footprint, haul road, detention pond, low level bridge and Commonwealth Edison towers.

The bridge, haul road, detention pond, low level bridge and Commonwealth Edison towers to be constructed will remove 2.5 acres of marsh cover type in this area. See discussions of cover types impacted in the Des Plaines River valley in Section 4.11.1.2. In addition, a temporary impact to potential foraging areas could occur due to the raising of the Commonwealth Edison lines, due to the need to access the towers with heavy equipment during construction. Any fill placed to secure access will be removed after construction to return the area to its preconstruction condition.

Another aspect of the corridor through the Des Plaines River valley when considering the project's affect on the dragonfly, is the height of the **recommended** bridge. FAP Route 340 is being carried on structure over the valley with the top of structure approximately 80 feet in height. Hine's emerald dragonflies have been observed during all three phases (pre-reproductive, reproductive, and post-reproductive) of their adult stage, flying at heights from 3 to 65 feet over roads near breeding sites. During feeding, flying heights are only from 3 to 20 feet above the ground. **In the project area, dragonflies have been observed flying 3 to 30 feet above a roadway with 77% of all observed heights being greater than 5 feet above the ground and 53% in the 6 to 10 foot range.** Since the bridge is not located near a breeding site, and the roadway is over 65 feet above habitat that might be used for foraging, the foraging habitat impacts to dragonflies flying near the highway are not expected **and the dragonflies are not expected to have collisions with vehicles on the bridge.** [sentence deleted]

Measures will also be incorporated into the project plans to protect this area from potential fuel spills during construction, including the restriction of fueling construction equipment south of the Des Plaines River. These measures will result in no impact to the dragonfly due to fuel spills.

Even though there may be losses of potential foraging habitat, there are no critical habitats designated in the project areas. An abundance of other foraging areas, such as sites at Lockport Prairie Nature Preserve, will remain intact throughout the project. The loss of foraging habitat does not appear to be a limiting factor for the dragonfly.

For the following reasons no impacts upon the dragonfly are expected **[phrase deleted]**:

- 1) Highway runoff is collected over the Des Plaines River Valley wetland, and this reduces the primary source of sodium chloride, heavy metals, and oil and grease.
- 2) Salt spray deposition occurs primarily in the months of December through March when the activity of the dragonfly nymph may slow, but there are no breeding areas within approximately 5 miles of the structure.
- 3) The water located in most of the foraging areas is within the wetland cover types of the Des Plaines River as shown in Exhibit 2-15. These areas are flushed in the months of March and April by the Des Plaines River when high flows occur. As discussed by Cashatt et.al., (1991), these lower quality wetlands are sufficient for foraging but could not be used for breeding. Therefore, the water quality in the forage areas is controlled by the river water quality. These areas, although not appropriate for breeding, will continue to provide foraging for the dragonfly in the late spring and summer. Current chloride concentrations in these wetland areas show the effects of the Des Plaines River water quality, and the incremental changes associated with FAP Route 340 should not exceed the General Use Water Quality Standards.
- 4) The food source of the dragonfly should not be affected by salt spray. The dragonfly feeds upon small flying insects. In reviewing acute chloride concentrations for mosquitoes and caddisflies, two orders of flying insects, the U.S. EPA reported an acute toxicity concentration for chlorides of 6,222 mg/l and 4,039 mg/l, respectively. Such concentrations are not anticipated in the foraging areas due to periodic flooding of the area and distance from the FAP Route 340 bridge. In addition, the General Water Quality Standards were established to protect macroinvertebrates. The chloride concentrations of 500 mg/l, which is the water quality standard, will protect these macroinvertebrates, which are a food source for the dragonfly.
- 5) One potential breeding area occurs in a calcareous seepage stream emerging from the bluffs approximately one mile east of FAP Route 340 (as noted in Cashatt's 1992 report). Breeding has not been confirmed at this location, however. Water quality information for the seeps was presented in Section 2 and expected changes in water quality were described in Section 4.10.5. In the specific literature salt spray has been determined to extend as far as 1,500 feet (Jones, et al, 1992) and 3,300 feet (Kelsey and Hootman, 1992). The deposition reported at such distances, however, declines rapidly and, as previously stated in other studies, will not significantly affect soil concentrations and hence water concentrations.

The time period of salt spray occurrence is typically November through April, and when deicing ceases, the salt spray will also diminish. Because groundwater continues to flow year round and the dragonfly breeds during June, salt spray is not expected to increase groundwater chloride concentrations during breeding season.

A study of the Hine's emerald dragonfly will be conducted to increase the knowledge base of this insect. Participants in the study include the U. S. Fish and Wildlife Service (**FWS**), Illinois State Museum, IDOT and ISTHA. The study includes a preconstruction, construction and post construction component. Information obtained from this study could be used to enhance efforts to restore populations of this species. **The findings of the preconstruction phase have been summarized in Section 2.12.3.1. On November 13, 1995 the FWS concurred that there are no adverse effects to the Hine's emerald dragonfly as a result of this project (See Appendix B under Fish and Wildlife Service). IDNR also concurred with the FWS findings (See Appendix B under Illinois Department of Conservation).**

A component of the post construction study may be the identification of suitable wetlands in Black Partridge and Keepataw Forest Preserves as breeding habitat for this species. These areas may need to be enhanced by management of the vegetation (opening of the shrub canopy) and drainage (Cashatt, 1992). One opportunity could include the fen at the base of the bluff south of Bluff Road in the Keepataw Forest Preserve (Figure 4, Site E, Cashatt, et. al, 1992).

The project will not jeopardize the continued existence of any plant or animal species currently listed as Federally Endangered.

4.11.3.2 State-listed Species

Reptiles

Primary habitats for the spotted turtle are located 5,000 feet west of the preferred alignment. Only marginally suitable habitat exists within the right-of-way of the preferred alignment and no spotted turtles have been found in the project corridor. The project would have no adverse impact on this species.

Birds

The great egret, black-crowned night heron, and double-crested cormorant will be temporarily impacted during construction. The activity and noise of construction of both the highway and along the haul road and Commonwealth Edison right-of-way will reduce or eliminate foraging by these species within and near the alignment during the years that construction is underway. Vos et al., (1985) and Erwin (1989) studied the response of colony nesting birds to human disturbance. Vos found that the greatest distance at which breeding great blue herons were disturbed by people was at 200 meters (660 feet). Disturbance of foraging activity by the presence of work crews may be expected to decrease later in each growing season due to the increase of foliage acting as a screen

between birds foraging on the ground and the work crews. As work on the project progresses, some birds could habituate to human activity. However, haul roads constructed within the wetlands will result in the loss of foraging habitat. After construction is complete, foraging by these birds is expected to resume. Highway runoff will be processed through a stilling basin prior to entering the wetlands in which the birds forage. Studies conducted by the Morton Arboretum (Kelsey and Hootman, 1992) indicate damaging effects of salt spray on sensitive plants species within 900 feet of the East-West Tollway (I-88). Such effects could potentially alter the composition of sensitive wetland vegetation, and the habitat suitability for prey species of these birds. However, the wetlands in the project corridor are dominated by cattails, a salt tolerant species. Thus, salt is not expected to affect the suitability of areas near the bridge for foraging by these birds.

A heron colony located south of Goose Lake (Exhibit 2-15, Malmberg, 1990) is currently used only by great blue herons but it appears to be suitable for future use by great egrets, black-crowned night herons, and double-crested cormorants from the expanding population at Lake Renwick. The construction of the **recommended** bridge 75 feet above ground level will be visible from the rookery (especially from nests which are at the top of trees) but is 4,000 feet away. Erwin's (1989) and Vos's (1985) studies imply that, provided there is no human intrusion within 650 feet to 1,000 feet of the nesting colony, the presence of work crews on the bridge or the ground should not jeopardize the use of the Goose Lake rookery by wading birds.

The rookery is about the same distance from the **recommended** bridge as the existing Lemont Road/Stephen Street bridge over the Des Plaines River. Furthermore, the rookery at Lake Renwick, which has for many years been 1,500 feet from U.S. 30, has in recent years expanded closer to U.S. 30, to approximately 500 feet from the road. Similarly, the heron rookery at Bakers Lake is about 1,500 feet from U.S. 14. Therefore, once constructed, the highway and bridge are not expected to have any effect on the rookery.

The impact on these species could only be completely avoided if the project were not constructed on the **preferred** alignment. Shifting the alignment further west to avoid foraging areas would not be a feasible alternative because this would cause adverse impacts to other listed species. Shifting the alignment east of Lemont would avoid impacts to foraging areas of colonial birds. The shifts east and west and the reasons why they are not practical and/or feasible are discussed in Sections 3.4.3 and 3.4.4.

Construction of the project along the **preferred** alignment could result in the loss of foraging or nesting habitat for the pied-billed grebe and the common moorhen. This adverse impact could only be completely avoided if the project were not constructed along the **preferred** alignment. Shifting the alignment further west to avoid foraging areas would not be a feasible alternative because this would cause adverse impacts to other listed species. Shifting the alignment east of Lemont would prevent any impact to the common moorhen. A shift to the east is not feasible because it would cause adverse impacts to the Black Partridge Nature Preserve and the environmentally sensitive Goose Lake area where several state endangered species are known to forage. Sections 3.4.3 and 3.4.4 discuss fully the reasons why the alignment cannot be shifted to the east or west, respectively. Mitigation measures to reduce impacts during construction are discussed in Section 4.23.

An osprey was observed once in and around Goose Lake (Malmborg, 1990); however, it is unlikely that this species either nests or forages extensively in the project area and the project would have no adverse impact on ospreys.

The brown creeper, Cooper's hawk, and northern harrier were observed in the project area during the autumn and/or winter census. These species are considered to be either winter residents (brown creeper) or migrants (Cooper's hawk and northern harrier) through the area.

Brown creepers were observed in the Black Partridge Nature Preserve. Because the Preserve is outside the alignment, the project should have no adverse impact on this species. There is no evidence that Cooper's hawks breed within the project corridor and the project would have no adverse impacts on this species. There also is no evidence that the northern harrier breeds within the project corridor. Because the northern harriers preferred habitat, forbland, is relatively common in northern Illinois, the project would not adversely affect this species.

Plants

The white lady's slipper is located approximately 3,000 feet east of the FAP Route 340 alignment and the project would have no adverse impact on this species. The sedge (*Carex crawei*) is located 1,200 feet and 3,000 feet west of the preferred alignment. Two populations, approximately 3,000 feet west of the alignment, are near to the Commonwealth Edison right-of-way; however, the project should have no adverse impact on this species. Mitigation measures described in Section 4.23 will locate and protect this species during work on the power lines.

The population of slender sandwort that is within 500 feet of the centerline could be adversely affected by physical alteration of habitat during construction activities or by salt spray from the highway. The slender sandwort is somewhat tolerant of disturbance (Taft, 1989), and given appropriate protection, the population located within 500 feet of the highway should not be adversely affected. Proximity of the highway could interfere with the fire management that is desirable for maintaining the habitat of this species. However, the limited size of the population should allow for appropriate management techniques to be employed by the owner of the land. The other populations are much further from the alignment (at least 1,600 feet) and the project would have no negative impact on them.

In the *DEIS* *Carex atherodes* was discussed. However, since the publishing of the *DEIS*, *carex atherodes* has been delisted.

Overall, with the appropriate mitigation measures implemented, this project will not have a significant impact on the continuing existence of any state-listed threatened or endangered species.

4.12 Air Quality

4.12.1 Introduction

The air quality analysis of this project was prepared in accordance with procedures contained in the Illinois Department of Transportation (IDOT) Air Quality Manual, dated May 1982. These procedures were adopted as standard after coordination with the Illinois Environmental Protection Agency, Division of Air Pollution Control, and the Federal Highway Administration, Illinois Division Office. The analysis is consistent with the latest mobile source emission factors issued by the U.S. Environmental Protection Agency known as MOBILE 5a and Conformity Regulations dated November 11, 1993, (40 CFR Parts 51 and 93 "Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act". The Chicago area including the project area is a severe ozone non-attainment area.

4.12.2 Carbon Monoxide Analysis

4.12.2.1 "Worst Case" Location Determination

As specified in the IDOT Air Quality Manual, Carbon Monoxide concentrations were calculated for a "Worst Case" site for the years 1994, 2000 (the Estimated Time of Completion - TOC), 2010 (Ten Years after Time of Completion) and 2010 (Design Year). A "Worst-Case" receptor is defined theoretically as a location nearest the roadway segment with the highest traffic volumes and lowest average speeds on the project route and nearest to a high volume crossroad. The project study corridor was evaluated to identify the sensitive receptors closest to the existing and **recommended** facilities which best satisfy these criteria.

Using IDOT methodology, three locations were initially tested for being the "Worst Case", one each at Interstate Route 55 and at Interstate Route 80. A third site, at 159th Street, was also evaluated; as this is the crossroad with the next highest traffic volumes. These tests indicated that the location at Interstate Route 55 was the "Worst Case" and the other two locations were eliminated from further analysis. For the location of this site, see Exhibit 2-16.

Subsequent to the FAP Route 340 *Draft Environmental Impact Statement and Section 4(f) Evaluation (DEIS)*, an air quality analysis was performed on the mainline toll plaza near Bruce Road based on the Illinois State Toll Highway Authority's (ISTHA) design requirements. IDOT methodology, as described in the latest IDOT Air Quality Manual, was used to determine the build and no-build actions for the years 1994, 2000 (Time of Completion), 2010 (Ten Years after Completion), and 2010 (Design Year) based on the eight-hour maximum volume of traffic (see Table 4-11). Based on both analyses, the mainline toll plaza and the Interstate Route 55 and Interstate Route 355 interchange have been determined to be the "Worst case" locations for the 8-hour carbon monoxide concentrations.

4.12.2.2 Eight-Hour Carbon Monoxide Concentrations

The concentrations for the "Worst Case" provided in Tables 4-10 **and 4-11** indicate that the National Ambient Air Quality Standards (NAAQS) will not be exceeded for Carbon Monoxide for

either the Build or the No-Build Alternatives. Consequently, no substantial impact would result from construction of FAP Route 340. The 8-hour primary standard for CO is 9.0 ppm.

Table 4-10
8-Hour Carbon Monoxide Concentration (ppm) for Worst Case Location -
At Interstate Route 55

Year	No-Build Alternative	Build Alternative
1994	6.6	-
2000 (Time of Completion)	4.6	4.9
2010 (Time of Completion + 10 years)	3.7	3.8
2010 (Design Year)	3.7	3.8

Source: MOBILE 5a Using IEPA inputs with 1990 CAAA Effects (May, 1995).

Table 4-11
8-Hour Carbon Monoxide Concentration (ppm) for Worst Case Location -
At Mainline Toll Plaza

Year	No-Build Alternative	Build Alternative
1994	2.0	2.0
2000 (Time of Completion)	2.0	3.4
2010 (Time of Completion + 10 years)	2.0	4.4
2010 (Design Year)	2.0	4.4

Footnote: The analysis assumed "Worst Case" meteorological conditions, a receptor distance of 250 feet was used based on location of highest traffic density and lowest speed, and ISTHA traffic projections. 2 ppm represents background conditions.

Source: Wight & Company (April, 1995)

4.12.2.3 One-Hour Carbon Monoxide Concentrations

The detailed analysis of local Carbon Monoxide levels has focused on the eight-hour standards, since this standard has almost without exception been found to be more critical than the one-hour standard. Analysis of available statewide air quality data, published annually by the Illinois Environmental Protection Agency, indicates that excursions above the one-hour primary standard of 35.0 ppm are extremely rare even at sites which annually record excursions of the eight-hour primary standard of 9.0 ppm. Furthermore, the assumptions used in the "Worst Case" modeling procedure regarding maximum eight-hour traffic volumes and meteorological persistence would also cause the eight-hour standard to be more stringent.

4.12.3 Other Pollutants

4.12.3.1 Hydrocarbons and Oxides of Nitrogen

Mesoscale impacts of hydrocarbons (HC) and oxides of nitrogen (NO_x) levels have not been predicted in this report because of the unavailability of acceptable analysis methods. Although, these pollutants might be quantified at the source (tailpipe) with some reasonable accuracy. However, they are reactive with each other and other atmospheric constituents and impurities and in the presence of sunlight, they produce ozone (O₃).

The photochemical reactions are dependent upon the amount of pollutants (HC, NO_x, O₃) present in the atmosphere as well as the amount and intensity of sunlight present on any given occasion. As a result, the actual effect of the pollutants may not be observed in the vicinity of the project, but rather at some considerable distance from the source. As the pollutants are transported, the problem is further complicated by the contributions of reactive pollutants from other sources both fixed and mobile.

Hydrocarbons are produced in greatest concentrations by idling engines and decrease with increased vehicle speed to about 50 to 55 mph, where their concentration tends to level off at a relatively low value. Oxides of nitrogen usually have minimal concentrations between 5 and 15 mph. At speeds greater than 15 mph, NO_x concentration in gasoline-powered vehicles increases with vehicle speed, reaching its maximum concentration at highest vehicle speed.

The construction of FAP Route 340 is proposed to provide the current and future motoring public with an adequate and safe highway. Future users of FAP Route 340 would be on a highway for vehicles operating at speeds of 50 to 55 mph with no stops for at-grade intersections. This situation will typically produce higher area-wide concentrations of NO_x and lower area-wide concentrations of HC. With the No-Build Alternative, however, users of parallel arterial routes would experience increasing traffic and congestion together with continued lowering of vehicle operating speeds. This situation will produce higher concentrations of HC and lower concentrations of NO_x in the study area.

4.12.4 Conformity with State Implementation Plan

The Chicago Area Transportation Study's Policy Committee, the region's Metropolitan Planning Organization, has conducted a conformity analysis of the transportation plan and program in the Chicago ozone non-attainment area. The analysis of the regional emissions of the Revised 2010 Transportation System Development (TSD) Plan, which included this project, indicated 0.6% lower hydrocarbon emissions under the plan network than under the no-build alternative network for 2010. The conformity analysis of the FY 94-98 Transportation Improvement Program (TIP) yielded the total emissions of volatile organic compounds and nitrogen oxides presented in Table 4-12.

Table 4-12
Total Emissions
(Analysis Using MOBILE 5.0 Rates Without 1990 CAAA Effects)

	VOCs (tons per day)	NOx (tons per day)
1990	515.55	647.04
1996 Baseline	247.52	479.77
1996 Action	246.88	472.40
2007 Baseline	141.26	352.57
2007 Action	139.87	350.69

Source: Revised 2010 Transportation System Development Plan for Northeastern Illinois and Transportation Improvement Program for Northeastern Illinois Conformity Supplement, October, 1994.

This project is included in the Revised 2010 Transportation System Development Plan and in the analysis for the FY 1994-98 Transportation Improvement Program (TIP), endorsed by the Chicago Area Transportation Study, the region's Metropolitan Planning Organization. This project was included as a non-federally funded, regionally significant project in the conformity analysis for the FY 94-98 TIP, as a four lane project. The Revised 2010 Transportation System Development Plan along with the TIP were found to conform by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on August 19, 1994. These findings were in accordance with the U.S. Environmental Protection Agency (EPA) regulations entitled "Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act," 40 CFR Parts 51 and 93." Therefore, this project conforms to the existing State Implementation Plan and does not contradict any specific requirement or commitment of that plan.

4.12.5 Measures to Minimize Impacts

The calculated levels of carbon monoxide are well below the National Ambient Air Quality Standards and, therefore, measures to minimize harm are not **recommended**. However, Section 4.19 (Construction Impacts) will give methods of minimizing air quality impacts as a result of construction activities.

To minimize fugitive dust adjacent to sensitive areas, water will be applied to dust generating areas as specified in Section 221 of the pending Revised ISTHA Standard Specifications for dust control watering.

4.13 Noise

4.13.1 Definition of Noise Impact

One decibel (dB(A)) is the smallest change in sound level an average person can detect under ideal conditions. Usually, an observer cannot notice an increase in noise of 3 to 4 decibels if the increase takes place at a uniform rate over several years. To an average listener, a difference of 10 dB(A) was perceived half as loud or twice as loud.

The equivalent, steady-state noise level, L_{eq} is used to analyze traffic noise levels and identify noise impacts. Based on the Federal Register 23-CFR-772, L_{eq} is defined as the sound level which, in a stated period of time, contains the same acoustic energy as the time varying sound level during the same period.

4.13.2 Regulations

4.13.2.1 Federal Regulations

The Federal Highway Administration (FHWA) policies and procedures, as promulgated in the United States Code of Federal Regulations, 23 CFR, Part 772, served as the procedural guidelines in the analysis. Incorporated into the regulations are Noise Abatement Criteria (NAC) which are based on the type of land use and activities performed at the respective sites (Table 4-13). At residences and schools, for example, noise abatement must be examined and evaluated if an equivalent steady state level of 67 A-weighted decibels (dB(A)) for an hourly period is approached or exceeded with "approached" being defined as one decibel less than the NAC. In this case, 66 dB(A). Traffic noise impacts also occur if there are substantial increases in noise over existing conditions, independent of the NAC.

4.13.2.2 State Regulations

In implementing the FHWA 23 CFR, Part 772 guidelines, the Illinois Department of Transportation defines traffic noise impacts to occur under the following circumstances:

- Design-year traffic noise approaches or levels exceed the NAC.
- Design-year noise levels are within two dB(A) of the NAC and exceed existing traffic-generated noise levels by more than 12 dB(A).
- Design-year traffic noise levels are greater than 14 dB(A) above existing traffic-generated noise levels.

Noise abatement must be evaluated at receptors where predicted traffic noise impacts occur.

Table 4-13

FHWA Noise Abatement Criteria
Hourly A-Weighted Sound Levels - Decibels (dB(A))

Activity Category	L _{eq} (h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Public areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

SOURCE: Federal-Aid Policy Guide, Federal Highway Administration, 23 CFR, Part 772

4.13.3 Traffic-Generated Noise Levels

Forty-five receptors were selected as representing their surrounding area including two receptors located in the vicinity of the **recommended** toll plaza situated north of Bruce Road and south of 167th Street. The locations of these receptors are shown in Exhibit 2-16. These receptors represent farm houses and single-family residences. Noise levels from these sites will be used to assess impacts for nearby sites with similar characteristics (i.e. distance to the alignment, traffic volumes, location relative to project area). Toll facilities will also be located at certain ramps along FAP Route 340. Although these ramp facilities will change the acceleration/deceleration locations on the ramps, the noise characteristics will be the same.

The year 2010 traffic-generated design-hour noise levels were predicted using the traffic noise prediction model, Stamina 2.0/Optima 3.0, which is an FHWA approved version. Predicted values are based upon such considerations as roadway configuration, design-hourly traffic volumes, average traffic speeds, traffic composition, and terrain. Both the **recommended** action and the no-action alternatives were analyzed. The calculated noise levels are summarized in

Table 4-14. These values (existing, **recommended** action, and no action) were used to evaluate whether noise impacts would result from the project.

4.13.4 Consideration of Abatement Measures

There are three possible ways to abate traffic noise at existing receptors: change the source, change the receptor, or change the noise path between the source and the receptor.

Noise from vehicles is subject to control by regulatory authorities such as the U.S. EPA for engine and tire noise and local law enforcement for horn and muffler noise. Traffic management measures most effective in reducing noise levels include prohibition of heavy trucks and use of lower speed limits. The prohibition of heavy trucks along this route would not be practical. Lowering the speed limit would reduce the level of service provided by the highway and thereby increase delays, air pollutant emissions, and the overall cost of transporting goods and services. Also, this would create an enforcement problem and, in light of the minor noise benefits, is not practical or reasonable. Use of smoother aggregates in pavement mixes can also reduce traffic noise levels. However, this severely reduces skid resistance and is not practical for FAP Route 340.

Alteration of the receptor, moving or replacing it, is not an economically justifiable option for noise abatement.

The remaining options all deal with changing the noise path, essentially the line-of-sight, between the source and the receptor. This can be done by lengthening, interrupting it, or a combination of both.

FAP Route 340 is located in gently rolling terrain with the exception of the river channel. Due to the hummocky topography of the project area, it will be difficult to use natural terrain features as noise barriers. Every opportunity was made to depress the roadway to reduce traffic noise levels. The preferred alignment was depressed to an elevation within the limitations of positive drainage, stream crossings, and grade separations. Deliberately depressing the roadway may be effective in reducing the sound levels up to 5-10 dB(A).

Doubling the distance between the source and receptor will decrease sound levels by only 3 dB(A). Shifting the horizontal alignment can contribute attenuation at a specific site, but requires major shifts to create a perceptible change in traffic noise levels. However, this shift could create adverse impacts to other locations in a variety of ways.

Section 4.19 (Construction Impacts) will discuss abatement measures to be considered during construction activities.

Dense woods or landscaping provide a visually pleasant noise screen and can provide up to 5 dB(A) attenuation of each 100 feet of width, provided it is 18-20 feet high. However, the additional right-of-way costs often prohibit the use of wooded noise screens. A single row of

sparsely arranged trees gives little noise attenuation, but does provide psychological reduction of noise. Where forested areas exist, local authorities or residents could maintain the landscape and the resulting attenuation.

Noise walls or berms, or a combination of the two, placed adjacent to the roadway will attenuate traffic related noise. These barriers are the most practical and commonly used measures. The slope of berms is generally limited to a maximum 3 (horizontal) to 1 (vertical) ratio due to maintenance. Therefore, as height increases, the width of the base increases and this may interfere with the roadway drainage patterns or conflict with the physical constraints of the site. Also, additional right-of-way may need to be purchased. Retaining walls may provide the attenuation desired and not conflict with the drainage or spatial constraint. Every reasonable opportunity will be taken to incorporate earthen berms and noise walls as the traffic noise abatement options for FAP Route 340.

When proven to be reasonable and feasible, noise wall barriers are used as noise abatement measures. An effective barrier must break the line of sight and typically extends parallel to the alignment four times the perpendicular distance to the right-of-way, and provides a reduction of about 5-6 dB(A). This level of effectiveness is typically required to justify construction. Note that minimum heights for barriers is six feet: this allows the wall to serve as an access control measure and a noise abatement measure.

4.13.5 Noise Abatement and Measures to Minimize Impacts

See Table 4-15 for areas near the preferred alignment that were predicted to experience traffic noise impacts and were analyzed for noise abatement measures.

Noise abatement measures which are economically reasonable and feasible are considered likely for each impacted site. There are noise impacts for which no prudent solution is reasonably available. Criteria in this determination includes the physical constraint of the area, the reduction (in dB(A)) of the traffic noise levels, and reasonable and feasible economic factors. If during final design the conditions of the impact site or project substantially change, the abatement measures will be reevaluated. A final decision on the installation of abatement measure(s) will be made upon completion of the project design.

Results of noise abatement analyses are shown on Table 4-15. These preliminary indications of likely abatement measures are based on preliminary designs for barriers at height, length, cost, and noise level reduction potential as given in Table 4-15. Refer to Exhibit 4-6 for location of noise abatement measures likely to be implemented.

4.13.6 Noise Impacts on Section 4(f) Properties

There are four Section 4(f) properties located within the preferred alignment. The Lustron House, the Illinois and Michigan Canal (I&M Canal), Centennial Trail and Keepataw Forest Preserve. The Lustron House will be relocated outside of the FAP Route 340 corridor. Another

Section 4(f) property, the Black Partridge Nature Preserve is east of FAP Route 340, separated by a buffer zone which minimizes potential noise impacts. This leaves the I&M Canal, Centennial Trail and Keepataw Forest Preserve to be evaluated.

The I&M Canal, Centennial Trail and Keepataw Forest Preserve will have similar noise effects caused by FAP Route 340; but because the I&M Canal and Centennial Trail are located in the industrial portion of the Des Plaines River Valley and there are no planned uses of the areas that would be sensitive to noise increases, only the Keepataw Forest Preserve was modeled for noise impacts.

Currently the Keepataw Forest Preserve is not easily accessible due to the steep bluffs and lack of development. A small, gravel parking lot and short trail system were built in the western section of the preserve (see Section 2.7), but usage is limited. Current future plans are to keep this area as natural as possible, with no plans to develop them. There are currently no sensitive activities nor planned uses of the Section 4(f) properties adjacent to the preferred alignment.

Noise modeling has been performed in the Des Plaines River Valley specifically within the Keepataw Forest Preserve. For the preferred alignment, Keepataw's decibel range is from 59 dB(A) at approximately 1300 feet from the centerline of the bridge to a maximum of 64 dB(A) approximately 200 feet from the centerline of the bridge. At about 100 feet from the centerline just beyond the bridge parapet wall, the noise levels drop by 3 dB(A) due to the "shadow" effect that the elevated bridge has on the River Valley below.

Using the criteria defined in Section 4.13.2, these readings show that the predicted noise falls below the 67 dB(A) that defines impacted areas. Additionally, there are no sensitive receptors as

defined by FHWA guideline 23 CFR, Part 772 that would be impacted within the Keepataw Forest Preserve.

TABLE 4-14

NOISE LEVELS AT SENSITIVE RECEPTORS IN THE FAP ROUTE 340 PROJECT AREA

Receptor	Noise Abatement Criteria	No. of Structures Represented	Existing*	No-Action (Year 2010)*	Proposed Action (Year 2010)*	Prop Inc Over Existing	Prop Inc Over No-Action
SOUTHERN SECTION							
1 (R)	67	20	<u>70</u>	<u>73</u>	<u>71</u>	1	-2
2 (R)	67	18	<u>70</u>	<u>72</u>	<u>73</u>	3	1
3 (R)	67	4	60	62	64	4	2
4 (R)	67	27	60	62	64	4	2
5 (R)	67	16	64	65	<u>66</u>	2	1
6 (R)	67	6	60	62	65	5	3
7 (R)	67	1	60	62	65	5	3
8 (R)	67	1	55	62	65	10	3
9 (R)	67	1	55	62	65	10	3
11 (R)	67	13	48	41	62	<u>14</u>	21
14A (P)	67	70	43	46	62	<u>19</u>	16
15 (R)	67	1	50	51	<u>71</u>	<u>21</u>	20
15A (R)	67	8	50	51	<u>71</u>	<u>21</u>	20
TP-1	67	3	50	51	57	7	6
MIDDLE SECTION							
15B (R)	67	9	60	64	<u>67</u>	7	3
16 (R)	67	16	60	64	<u>67</u>	7	3
16A (R)	67	22	37	49	63	<u>26</u>	14
17 (R)	67	12	42	50	<u>74</u>	<u>32</u>	24
17A (R)	67	4	42	50	<u>74</u>	<u>32</u>	24
18 (R)	67	17	39	45	59	<u>20</u>	14
19 (R)	67	17	39	45	59	<u>20</u>	14
21A (R)	67	2	45	64	<u>70</u>	<u>25</u>	6
21B (R)	67	4	45	45	59	<u>14</u>	14
22 (R)	67	5	61	56	62	1	6
22A (R)	67	5	61	48	64	3	16
23 (R)	67	1	51	60	61	10	1
24 (R)	67	8	51	60	61	10	1
25 (R)	67	22	41	45	<u>69</u>	<u>28</u>	24
26 (R)	67	4	51	60	61	10	1
27 (R)	67	2	51	60	61	10	1
28 (R)	67	1	41	45	<u>69</u>	<u>28</u>	24
29 (R)	67	3	41	45	<u>69</u>	<u>28</u>	24
30 (R)	67	2	50	54	64	<u>14</u>	10
31 (R)	67	3	50	54	64	<u>14</u>	10
32 (R)	67	5	50	54	64	<u>14</u>	10
NORTHERN SECTION							
33 (R)	67	3	41	54	59	<u>18</u>	5
33A (P)	67	88	41	44	62	<u>21</u>	18
33B (R)	67	1	31	45	58	<u>27</u>	13
34 (R)	67	3	58	64	<u>67</u>	9	3
35 (R)	67	4	58	<u>66</u>	<u>69</u>	11	3
42 (R)	67	3	36	45	62	<u>26</u>	17
43 (R)	67	2	38	46	64	<u>26</u>	18
44 (R)	67	2	38	49	61	<u>23</u>	12
45 (R)	67	20	65	<u>75</u>	<u>71</u>	6	-4
46 (R)	67	1	<u>67</u>	<u>74</u>	<u>69</u>	2	-5

(P) - Represents proposed residential developments

(R) - Represents existing residence

* Underlined values represent violated criteria

TABLE 4-15
RESULTS OF NOISE ABATEMENT ANALYSIS

Receptor	No. of Structures Represented	Barrier Height In Feet	Barrier Length In Feet	Cost* (\$25/Sq. Ft.)	Reduction Potential dB(A)	Likely To Be Implimented	If No Reasons Why
SOUTHERN SECTION							
1 (R)	20	15	1200	\$450,000	7	YES	-
2 (R)	18	15	1000	\$375,000	6	YES	-
5(R)	16	15	6800	\$2,550,000	1	NO	2
11(R)	13	25	7680	\$4,800,000	2	NO	2
14A (P)	70	25	8800	\$5,500,000	4-6	NO	1
15 (R)	1	25	1600	\$1,000,000	7-8	NO	1
15A (R)	8	25	1000	\$625,000	7-8	YES	-
MIDDLE SECTION							
15B(R)	9	15	1500	\$562,500	2-3	NO	2
16(R)	16	15	1500	\$562,500	2-3	NO	2
16A (R)	22	25	4700	\$2,937,500	4	NO	2
17 (R)	12	-	-	-	-	NO	2
17A (R)	4	25	2200	\$1,375,000	13	NO	1
18 (R)	17	25	10200	\$6,375,000	2	NO	1,2
19 (R)	17	25	10200	\$6,375,000	2	NO	1,2
21A (R)	2	25	5400	\$3,375,000	8-9	NO	1,2
21B(R)	17	25	10200	\$6,375,000	2	NO	1,2
25 (R)	22	25	3700	\$1,400,000	9	YES	-
28 (R)	1	25	2200	\$1,375,000	9	NO	1,2
29 (R)	3	25	2600	\$1,625,000	9	NO	1,2
30(R)	2	15	1700	\$637,500	2	NO	1,2
31(R)	3	15	1300	\$487,500	2	NO	1,2
32(R)	5	15	2300	\$862,500	2	NO	1,2
NORTHERN SECTION							
33 (R)	3	15	3500	\$1,312,500	4-6	NO	1
33A (P)	88	25	3000	\$1,875,000	4	NO	2
33B (R)	1	25	11200	\$7,000,000	2	NO	1,2
34(R)	6	15	3400	\$1,275,000	4-6	NO	1,2
35(R)	4	15	3400	\$1,275,000	4-6	NO	1
42 (R)	3	25	1400	\$875,000	6-8	NO	1
43 (R)	2	25	2600	\$1,625,000	6-8	NO	1
44 (R)	2	25	2200	\$1,375,000	4-6	NO	1
45 (R)	20	25	1400	\$875,000	5	YES	-
46 (R)	25	15	5000	\$1,875,000	6-7	YES	-

Notes:

Receptors 16A and 17 share a common noise abatement barrier.

(P) - Represents proposed residential developments

(R) - Represents existing residence

* The cost includes preliminary analysis/design, final design and related construction costs.

1 - Not economically reasonable or feasible based on cost compared to benefit.

2 - Does not provide substantial noise abatement.

4.14 Solid Waste

4.14.1 Hazardous Waste

The U.S. Environmental Protection Agency (USEPA) listing of potential, suspected, and known hazardous waste or hazardous substance sites in Illinois (i.e., the Comprehensive Environmental Response Compensation and Liability Information System [CERCLIS] list) has been reviewed to ascertain whether the **recommended** project will involve any listed site(s). As a result of this review, it has been determined that the **recommended** undertaking will not require any right-of-way or easement from any site included in the CERCLIS listing as of June 9, 1992.

The Illinois Environmental Protection Agency releases a non-verified, unconfirmed list of Leaking Underground Storage Tanks (LUST) sites which should not be used or considered as a final Agency determination regarding whether releases have occurred at sites on the list. Sites have been included in this list based on report of releases at the site received by the Agency. The Agency in providing this list makes no representations regarding the accuracy of the information contained in the list. The Agency is in the process of confirming the type and size of release, if any; the proper owner or operator, and the location of each site. Included in this list (February, 1993) is Welco Truck Stop Corporation located at 131 South Joliet Road in Will County. There will be right-of-way purchased from Welco Truck Stop Corporation for construction of an access road and there will be reconstruction of Joliet Road.

A preliminary environmental site assessment for hazardous waste was conducted by the Illinois State Geological Survey (ISGS). The assessment concluded that the project is at a moderate risk because right-of-way acquisition includes parcels containing storage or disposal of 55 gallon barrels west of the HAM, Tug, and Fleeting Barge Company. As a result, additional preliminary testing for the project and a phase II preliminary site investigation for the area containing the barrels will be necessary. During field reviews in July, 1993, two additional sites in the Keepataw Forest Preserve were found to have 55 gallon barrels containing potentially hazardous material. These two sites are included in an addendum to the preliminary environmental site assessment study. Since the problematic areas are common to all alignments, specific waste characterization is not needed at this time. However, the Will County Forest Preserve District is in the process of having a consultant perform a waste characterization for the sites in Keepataw. Their studies will determine the nature of the waste material, identify the area of impacts, and prepare recommendations. The Will County Forest Preserve District is coordinating the necessary clean up measures for these sites with the Illinois Environmental Protection Agency.

4.14.2 Construction Debris

Construction and operation of FAP Route 340 will create solid wastes. Litter, demolition debris, and excavated vegetation are among the types of solid waste generated. Storage, collection and disposal of solid wastes will be in accordance with the Illinois State Toll Highway Authority (ISTHA) Standard Specifications Subsection 104.5. Contractors will reuse or recycle waste materials as they see fit. Where needed, trees will be removed during construction. While

landfill space is declining throughout the midwest, it is likely that disposal capacity for solid waste generated by FAP Route 340 will be available.

4.15 Visual Impacts

Visual impacts have been considered from three perspectives: the motorist's view from the road, the bicyclists view from the FAP Route 340 bikeway, and the view of the road as seen by those persons living, working or spending leisure time nearby. The motorist's view from the road will be predominantly agricultural lands typical of the area. There is little forested area to add scenic variety, except at the Des Plaines River crossing and the forest preserves in that area. FAP Route 340 will cross this area on an elevated bridge, providing new vistas. However, the height of the barrier wall (3 foot 6 inches) alongside the bridge will not allow motorists in cars access to these vistas. As there is no existing highway facility along the corridor, no visual impacts are anticipated from the motorists point of view.

The bicyclist's view from the bikeway would also be predominantly agricultural. However, this facility would provide access to areas previously not accessible to bicyclists on a dedicated route. Views of streams and the adjacent floodplains would provide visual relief. Bicyclists, unlike vehicles using the highway facility, would be able to stop and view an area of interest. As no new facilities will be provided for in the Des Plaines River valley, this area of visual interest is not a factor. Therefore, from a bicyclist's perspective, the project will have no adverse effect.

For those persons observing the highway, areas beyond the Des Plaines River valley are not expected to have any impacts. Within the valley, however, are areas of visual interest which should be considered from a visual standpoint. These areas include Black Partridge Nature Preserve and Keepataw, Black Partridge, and Lemont Woods (**Wood Ridge**) Forest Preserves. IDOT-owned, forested, right-of-way on the western boundary of Black Partridge Nature Preserve will serve as a visual buffer zone to eliminate any views of the highway. The recently purchased Bluff Oaks Estates (located immediately west of the preferred alignment, north of Bluff Road) will similarly eliminate visual impacts to viewers in the forested areas west of the alignment north of Bluff Road by serving as a visual buffer. At the same time, these two parcels will provide motorists on FAP Route 340 a pleasing view from the highway.

The construction of a 6600 foot long and 75 to 100 foot high bridge will be the main visual element for the highway as it crosses the valley. While the valley consists of a variety of differing visual elements, including high level bridges, the **recommended** bridge in the vicinity of the forest preserves is considered an impact. The size of the bridge, the availability of views from the south bluff and the length along the river of unbroken forest preserves contribute to the impact.

To mitigate the impact, bridge aesthetics will be very important. At the same time, the structure should minimize environmental impacts to the biological resources of the Des Plaines River valley. Coupled with the above is the need to be cost-effective as the expenses of this structure will be ultimately paid for by the users of the Tollway Highway System. ISTHA, as the

constructing agency, agrees its challenge is to design and construct a bridge which meets the goals of being aesthetically pleasing, environmentally sensitive and at the same time, cost-effective.

As part of the design process, ISTHA evaluated numerous bridge types and configurations to determine the best fit to the valley. Exhibits 3-9 and 3-10 are renderings of the two **recommended** bridge types, concrete and steel, from the perspective of a bicyclist on the Centennial Trail. ISTHA selected these concepts as the best fit for the valley in terms of aesthetics, environment and cost. The selection of the paint color will also provide an opportunity to blend the bridge into the surrounding landscape.

4.16 Utilities

The majority of utility impacts involve the relocation or reconstruction of Commonwealth Edison transmission towers. Gas and oil pipelines will be relocated and/or encased as required to allow maintenance, access and protection. The Citizens Utility water tank and wastewater treatment plant will not be affected by the Preferred Alignment. Where utilities are in their own right of way, the cost of adjustment, relocation, and protection will be part of the project expense. If utilities are located in the public right of way, the cost of modifications are typically the responsibility of the utility company. Generally, the utility work would occur in previously disturbed areas and would not generate any specific post-construction environmental concerns. Any utility adjustment, relocation or protection activity will generate short term construction impacts. The impacts include increased noise levels, emissions from motorized equipment, and particulate matter introduced to the atmosphere. The impacts are discussed in Section 4.19. The utility work and any specific environmental consequences are described below.

Referring to Exhibit 2-18 as a guide, the first utility crossing impacted is the Commonwealth Edison transmission line at Interstate Route 80. The interchange ramps will cause the relocation of two towers. In addition, the overhead lines will need to be raised since the mainline will be about 12 feet higher than existing ground. The impact to the surrounding area will consist of about 225 square yards of agricultural lands being taken out of production due to the new tower locations. The lands are owned by Commonwealth Edison. The agricultural impacts in this area are included in Section 4.5.

Pipeline crossings at Cedar Road, U.S. Route 6, 167th Street, Gougar Road, Illinois Route 7 (159th Street), and 151st Street may need to be adjusted, relocated, and/or reconstructed. Environmental impacts for these construction activities are expected to be as described above for short term construction impacts.

The crossing of the Commonwealth Edison high voltage lines between 143rd Street and Illinois Route 171 (Archer Avenue) will cause the relocation of **[word deleted]** one tower. **[sentence deleted]** Commonwealth Edison is currently studying this area. When their proposal is available the impacts will be evaluated.

At Illinois Route 171 (Archer Avenue) the crossing pipeline must be lowered by about 20 feet as the mainline is depressed in this area. Non-construction related impacts are not expected.

North of 135th Street the mainline crosses another Commonwealth Edison high voltage line. However, as the mainline is 20 feet below grade, the overhead lines are not impacted. Three major pipelines also cross the alignment and will need to be lowered. The utility companies will be coordinated with to make sure any special requirements are accounted for in assessing impacts. At this time the only known impacts would be the short term construction impacts listed above.

Several utility lines are parallel to the Des Plaines River Valley, however, as the mainline is on structure, these lines will not be impacted. The exception is the Commonwealth Edison high voltage line located north of and parallel to the Des Plaines River. The high voltage transmission lines are actually two independent circuits with the first being 345 Kv and the second being 138 Kv. Exhibits 3-11 & 3-12 shows the area occupied by the towers and overhead lines. As the utility is on land adjacent to Cook County and Keepataw Forest Preserve, special attention needs to be paid to potential impacts to the surrounding area.

As discussed in Section 3.5, Commonwealth Edison has reevaluated the transmission line crossings and plans to use dead-end towers on either side of the bridge allowing the transmission lines to cross over the bridge. The transmission line relocation work would be minimized and only affect the first two sets of transmission towers on either side of the bridge. Thus, the transmission line relocation work will be limited to an area approximately 1,200 feet in both directions from the centerline of the bridge. Construction access for the utility relocation work will be from an existing gravel road on the south bank of the Des Plaines River and a low level bridge built over the River. Environmentally sensitive areas such as the heron rookery will be left undisturbed. Evaluation of Commonwealth Edison's relocation proposal will continue and final impacts and mitigations will be included in the Final Environmental Impact Statement and Section 4(f) Evaluation.

The cover types vary along the length of the transmission line ranging from wetlands to spoil areas from previous mining operations (see Exhibit 2-15). The impacted areas by cover types are shown in Table 4-9.

4.17 Material Resources

The material resources required for the construction of FAP Route 340 consist of standard construction materials. They include concrete, steel, aggregate, and petroleum based products. None of these materials are in short supply.

The contractor shall furnish and pay for all borrow sites or other sources of borrow and obtain from the property owners the necessary agreements for the removal of the material. However, borrow excavation shall not be placed in an embankment until the site location, excavation plan, and material have been approved by the engineer in writing.

4.18 Energy Resources

Construction of the **recommended** FAP Route 340 improvement will require indirect consumption of energy for processing materials, construction activities, and maintenance for the lane miles to be added within the project limits. Energy consumption by vehicles in the area may increase during construction due to possible traffic delays.

Construction of the **recommended** improvement will result in more efficient traffic operations along the route and thereby reduce vehicle stopping and slowing conditions. Additional benefits would be realized due to the ability of regional travel to bypass congested portions of the interstate system. This will result in less direct and indirect vehicle operational energy consumption for the build alternative than for the no action alternative. Thus, in the long term, post construction operational energy requirements should offset construction and maintenance energy requirements and result in a net savings in energy usage.

4.19 Construction Impacts

During construction, blowing dust from areas cleared or excavated for access or construction purposes can be minimized in several ways. Water can be applied to unpaved road surfaces with a water sprinkler truck. The effectiveness of watering for fugitive dust control depends on the frequency of application. It is estimated that twice daily watering over the entire area would reduce dust emissions by up to 50 percent. On roads carrying heavy construction traffic, crushed gravel can be spread in conjunction with the normal sprinkling of the road with water to further impede the suspension of particulates. Watering for fugitive dust control will be a separate pay item in the construction contracts.

Most of the residents living along the preferred alignment will experience construction noise that may, at times, be noticeable. These noise levels will vary with the phase of construction. **Night time construction activities are expected to occur during the construction of FAP Route 340. Some of the activities that may be expected include, but are not limited to:**

- **The erection of steel or concrete girders over New Avenue which will require brief closures of traffic to insure the safety of the motoring public. These closures are typically limited to 15 minute windows. IDOT who has jurisdiction over New Avenue may require this work to be done at night when there is less traffic.**
- **Construction of earthen or rock embankments at the bridge approaches may be done at night to allow trucks of fill material to travel under lighter traffic conditions.**
- **Sawcutting of pavement joints may occur at night during the summer months so that the work can be done during cooler temperatures.**

It will be the responsibility of all contractors on the FAP Route 340 project to determine and comply with the limitations imposed by local ordinances with respect to construction operations, equipment noise and working time restrictions.

Sedimentation and soil erosion impacts will be greatest during the construction phase. To minimize harm, options in "Procedures and Standards for Urban Soil Erosion and Sedimentation Control in Illinois" will be utilized. Construction traffic in flowing streams will be avoided whenever practicable. Measures to limit impacts upon sensitive habitats may be taken, i.e., define construction limits along the length of the project and define and post signs at areas not to be disturbed during construction by installing physical barriers at each of the sensitive areas. The appropriate National Pollutant Discharge Elimination System (NPDES) industrial permits for roadway construction will be obtained prior to construction. Any abandoned groundwater wells would be sealed per Department of Public Health regulations.

To minimize any inconvenience and financial loss to local property owners as a result of construction activity, access to properties will be maintained by means of staged construction, temporary access roads, or other appropriate measures.

Temporary fences will be used in the Keepataw Forest Preserve and along the right-of-way near Black Partridge Nature Preserve to delineate "No Intrusion" areas which will limit the areas the contractor can occupy or store materials.

4.20 Secondary and Cumulative Impacts

Secondary effects are those impacts which are "...caused by an action and are later in time or further removed in distance but are still reasonably foreseeable" (40 CFR 1508.8), such as a new shopping center attracted to the vicinity of an intersection created by a new highway facility. Cumulative effects are those "...impacts which result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions" (40 CFR 1508.7). For example, degradation of a stream's water quality by several developments which taken individually would have minimal effects, but collectively would cause a measurable negative impact is considered a cumulative effect. This analysis concentrates on the area identified by the local planning organizations on the proposed land use plans (see Exhibit 2-5). As mentioned in Section 1.2.1, local planning and zoning has planned for the construction of FAP Route 340, greatly influencing proposed development patterns of adjoining land.

Local communities administer controls for land use decisions in the FAP Route 340 project area. Such controls are identified to varying degrees in local comprehensive plans, zoning ordinances, development standards, subdivision regulations, and similar documents. Local planning documents specify policies that should be followed to meet the regional land use planning goals described in the Strategic Plan for Land Resource Management (Northeastern Illinois Planning Commission, June 1992). These policies present general guidelines under which new development should occur.

On September 23, 1993 the Northeastern Illinois Planning Commission adopted a policy to guide planning efforts in the region. The policy states, "For major expressway or transit facilities the region should work to develop appropriate and reasonable local intergovernmental land resource planning agreements and development standards covering the impacted area. The development

standards would be applicable to both the project implementor and local governments. These agreements and standards should give full consideration to the management of land use density consistent with the provision of transportation infrastructure." This policy also indicates a three step process that should be utilized to help address direct, secondary, and cumulative impacts for projects. The specific project "should 1) properly be included in the long range transportation plan; 2) be coordinated with an intergovernmental land resource planning process covering the impacted area; and 3) be subject to a full environmental review equivalent to the requirements as presented in the National Environmental Policy Act." The FAP Route 340 study follows these recommendations.

The current long range transportation plan for northeastern Illinois is the 2010 Transportation System Development Plan which includes FAP Route 340 as a vital element in the regional transportation network. In the local planning documents, projects such as FAP Route 340 are considered to be necessary to accommodate anticipated population and economic growth in the region. The following aspects of land use planning can be used in the analysis of indirect impacts:

- local zoning
- land suitability for development
- local planning
- private sector development plans
- existing or planned public services such as sewer and water

Considerable population growth and proposed land use within the townships in close proximity to FAP Route 340 and for areas adjacent to the highway were described in Sections 2.4 and 2.5, respectively. The majority of the land in the FAP Route 340 corridor is currently zoned either agricultural or low-density residential. Local communities are continually annexing property in the project corridor in anticipation of rapid development. As Exhibit 2-5 shows, several changes in land use planning are proposed in the project corridor by the local communities. The general trend is to have commercial and industrial development adjacent to the highway with residentially zoned land further away. The conversion of various land uses to transportation right-of-way has been documented as a direct impact. However, as Exhibit 2-5 indicates, it is reasonably foreseeable that a significant amount of agricultural land would also be converted to other uses such as industrial developments. This potential loss of additional agricultural land is considered a secondary impact of building FAP Route 340 since it would be caused by future developments accommodated by access from the **recommended** highway facility. Local land use plans allow for considerable growth in the project area. As noted on Exhibit 2-5, none of the land in the project corridor is designated as agricultural or undeveloped at build-out development levels.

To assess impacts that may occur due to reasonable foreseeable growth, the following facilities have been identified within or near the FAP Route 340 project corridor. They are currently under construction or are planned for development in the near future. The Internationale Centre is a complex of industrial and light manufacturing sites under development to the east and west of

FAP Route 340, just south of Interstate Route 55 between Lemont Road and Joliet Road. The Broken Arrow subdivision and golf course is situated near Gougar Road and Bruce Road and is currently under construction. A thirty-three acre school expansion is planned at Centennial Park near 127th Street as a joint development project with the Lemont Park District and Village of Lemont. Aero Landings (currently an abandoned site) on 127th Street may be developed as a specialty residential subdivision featuring airplane ports attached to single family residences. **The Lewis University Airport** south of Romeoville (along Illinois Route 53) is planning to add runways to its facility. The Argonne National Laboratory is expanding within its current enclave, which is surrounded by Waterfall Glen. The Argonne facility is located to the northeast of FAP Route 340, just south of Interstate Route 55.

Perhaps the most significant development in terms of scope and potential impacts will be the new third airport at Peotone, to the southeast of the **recommended** FAP Route 340 project. If the South Suburban Expressway is built in the future, it would connect FAP Route 340 to Interstate Route 57 and then FAP Route 340 would serve as part of a major transportation corridor between the airport and the western suburbs. It is reasonable to conclude that development at interchanges to and from the new airport will occur. The airport would generate new car and taxi trips along with the shuttle bus services. The new airport would be a major stop for the planned High Speed Rail facility, located between Chicago and the St. Louis metropolitan area. It is likely that now vacant suburban areas would infill with development (urban sprawl). To the extent that local land use planning is effective, the expansion can be positive and result in limited impacts to natural resources.

These developments, combined with the FAP Route 340 roadway and the growth induced by this facility, will result in cumulative impacts to the natural resources of the area. However, many of these resources are under the regulatory authority of various state and federal agencies. Developers must coordinate their activities with the appropriate agencies and obtain the necessary permits or clearances. Impacts to natural resources (wetlands, listed species, air and water quality, etc.), are reviewed as the actions are **proposed**. Areas of Section 4(f) (park lands) and Section 6(f) (LAWCON funded lands), natural areas, nature preserves, and wetlands are protected by state and federal laws and regulations.

Indirect and secondary impacts, and additional cumulative impacts could occur due to new growth which can be directly attributed to the presence of the new roadway. Based on previous experience and various studies, new service oriented commercial development is likely to occur at new interchanges with local roads. Additional residential and commercial growth can be expected to occur under the following circumstances: 1) accessibility of undeveloped land suitable for development and the relationship to major employment centers, retail facilities and other services, 2) the image, market appeal and cultural amenities available, 3) the projected availability of water, sewer and other public facilities and services.

To the extent that the project area offers these features it is likely that when combined with the FAP Route 340 facility, new development will occur. The Homer Township area is experiencing rapid scattered subdivision development especially to the west of the **recommended** FAP Route

340 roadway. This trend is expected to continue and new subdivisions may locate near new interchange areas and areas surrounding New Lenox.

Recommended interchanges with local and secondary systems are likely to experience new commercial, service oriented development after FAP Route 340 is built. The new interchanges will be located at four sites along the project corridor: 127th Street, 143rd Street and Illinois Route 171, Illinois Route 7 and U.S. Route 6. It is reasonable to expect that secondary and cumulative impacts to natural resources will occur due to this highway induced growth. Secondary and cumulative resource impacts associated with both interchange and residential/commercial development include 1) loss of wetlands, 2) increased noise and air pollution, 3) decreased water quality, including impacts to macroinvertebrates which listed bird species depend upon as a food source, and 4) loss of prime farmland soils. The land use plan for the area (Exhibit 2-5) indicates that the land adjoining the tollway corridor will not be used for agricultural production in the future. Increases in noise pollution are too locality specific to be discussed in terms of secondary or cumulative analysis. With regard to air quality impacts due to growth, new businesses that want to locate in this area (either as a result of the tollway or not) must apply for IEPA Construction and Operating air permits and meet emission standards. Habitat loss and secondary/cumulative impacts to state and federally listed species are anticipated. Several listed species are known to be in this area of Illinois. The loss of habitat has been rapid and continual due to agricultural practices. Very few areas of quality habitat remain, and nearly all of these areas are under public ownership as nature preserves, natural areas or parks. It is logical to surmise that most of the listed species in the area reside within these protected areas. The potential effects on wetlands and water quality are discussed in the following paragraphs. These discussions are qualitative in nature as these developments are speculative and therefore not easily quantifiable. There are no known conversion rates that can be applied to growth estimates as yet and no way to calculate losses by habitat type.

Cumulative wetland impacts in the FAP Route 340 project corridor will occur as the area builds out. Development will eliminate some wetlands while surrounding others. Proximity to new development will have indirect impacts associated with fragmentation, noise, human access, disturbance of hydrology, and the introduction of pest species. Some fragmentation of the existing wetland system will occur, affecting wildlife migration. The ability of the remaining wetlands to function will depend very much on comprehensive wetland conservation plans and their implementation. Vegetative buffers between development and the remaining wetlands can be essential to continued wildlife use. A comprehensive mitigation program to minimize impacts and replace destroyed wetlands is the key to reducing cumulative impacts. Documents such as the Northeastern Illinois Regional Greenways Plan (Northeastern Illinois Planning Commission and Openlands Project, September 1992) provide a basis for identifying and preserving greenways while coordinating the region's natural resources with development pressures. The U.S. Army Corps of Engineers also regulate wetland resources on a regional level by means of the Section 404 permit process, thus having jurisdiction over both public and private development.

According to the Clinton Administration's policy on wetlands, "Protecting America's Wetlands: A Fair, Flexible, and Effective Approach" (White House Office On Environmental Policy, August 24, 1993), analyzing wetlands on an individual basis could impair the effective consideration of the cumulative effects of piecemeal wetlands loss and degradation. The recent policy recommends comprehensive planning conducted on a watershed basis. This wide-range planning enables the conservation of wetlands and other natural resources to be incorporated with local development plans. As an incentive for overall system planning, approved plans could receive a higher priority for technical and financial support from the Federal government. As stated by the Clinton Administration, the Executive Order on wetlands (E.O. 11990) will be revised to direct the Federal Agencies to take a watershed/ecosystem approach to wetlands protection and restoration.

Secondary impacts are likely to occur to the water resources. Specifically, the hydrology of surface waters, recharge rates for groundwater, and runoff pollutant composition and concentration would change. The type and magnitude of the changes depends on the type, density, and location of the development. Secondary impacts from this development could also result in cumulative effects over time. Development results in increased impervious surface area and increased traffic on the street. Average values of impervious surface area for developments increases from single-family residential on the low end, through multi-family residential, then commercial to industrial on the high end. Increased impervious surface area results in a more rapid, high, discharge runoff pattern. The effects on surface waters and groundwater will depend on how the stormwater runoff is handled, which in turn is dependent upon enforcement of local stormwater management regulations. Local stormwater ordinances often require compensatory storage at rates greater than 1:1 for floodplain encroachments. These strict local regulations can often result in no net effect to the quantity of stormwater runoff and runoff rates are reduced by detention. Current stormwater management ordinances in the project area are lenient, but regulations are expected to become more stringent as development occurs similar to DuPage and Lake Counties' policies on stormwater control in response to their rapid growth.

Since much of the land adjoining FAP Route 340 is planned for future industrial development, secondary impacts can be expected resulting in a high level of increased total impervious surface area. However, these impacts could be offset by compensatory storage requirements imposed upon the property developers.

Facility Planning Areas have been preparing for future development in the region, with specific emphasis on sanitary districts. The Lockport Heights and Bonnie Brae Forest Manor Sanitary Districts have proposed sanitary sewers that would eventually cross the FAP Route 340 alignment. Facility planning and infrastructure improvements are part of an on-going process coordinated between local governmental agencies and the Northeastern Illinois Planning Commission.

Mitigation for the effects of secondary and cumulative impacts can be in the form of new conservation easements and commitments to protection of "open lands" areas. The Illinois Department of Transportation (IDOT) and the Illinois State Toll Highway Authority are working

with the **Heritage Planning Council** in an effort to bring about sound land use planning and controlled development within the area of the highway corridor. While land use decisions and growth containment is a function of the local and regional land use planners, IDOT can make recommendations and provide information to the **Heritage Planning Council**.

In an effort to reach a common vision of future development in the area, local government agencies within a 1 1/2 mile corridor surrounding the highway extension formed the **Heritage Planning Council** in 1993. The group will consider the likely effects of transportation policy decisions on land use and development in the corridor and the compatibility of the transportation system with land use plans, policies, and practices. The **Heritage Planning Council** will serve as a forum for coordinated planning, for sharing information on development impacts, for avoiding the overload of public infrastructure, for enhancing the environmental quality, and for promoting intergovernmental cooperation. The **Heritage (I-355 Corridor) Planning Council's** letters dated January 26, 1995 and **September 7, 1995**, (see Appendix B **under Interstate 355 Southern Extension Corridor Planning Council**), state that the Council's work program will include an assessment of cumulative and secondary impacts. In response to the **Heritage Planning Council's** mission statement, a Land Use and Planning Committee has been established to develop a comprehensive land use plan for the corridor. The Land Use and Planning Committee will specifically consider impacts on natural resources as well as on transportation, wastewater, and water supply. The committee will address issues such as potential impacts on: the Regional Greenways Plan, the Forest Preserve's trail plan and other bicycle circulation issues, Strategic Regional Arterials, park and ride lots, and high speed rail proposals.

[paragraph deleted]

4.21 Short-Term Use and Long-Term Productivity Relationship

The relationship of FAP Route 340's local short-term impacts and use of resources to the maintenance and enhancement of long-term productivity is generally positive. Construction of the FAP Route 340 project will involve the short-term use of resources such as labor and construction materials. The project will also contribute to the maintenance and enhancement of long-term productivity for the communities in the project area and for the regional transportation network by being consistent with local planning (see Section 1.2.1). By improving access within the region and increasing employment in the region, FAP Route 340 will result in higher gross regional productivity.

Transportation improvements are based on regional and local planning which consider the need for present and future traffic requirements within the context of present and future land use development.

4.22 Irreversible and Irretrievable Commitments of Resources

Implementation of the **recommended** action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the **recommended** facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material will be expended. Additionally, large amounts of labor and natural resources will be used in the fabrication and preparation of construction materials. These materials are generally not retrievable; however, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both State and Federal funds which are not retrievable. This expenditure of Federal funds will not apply if the route is constructed as a Tollway.

The commitment of these resources is based on the concept that residents in the immediate area, region, and State will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of these resources.

4.23 Summary of Mitigation Measures

(also See Section 6.5 “Commitments”)

Mitigation measures are defined as those actions taken to compensate for an acknowledged impact. Therefore, the following steps are being taken in an effort to compensate for resources or entities that have been negatively affected by this project. (Note that mitigation items are included in the “Commitments” portion of this document, however, the remaining **items** in that section are meant to address the prevention of potential impacts to resources or entities.)

4.23.1 Noise

To minimize noise impacts from normal operations to sensitive areas, noise walls will be constructed. The locations of the noise walls will be as determined in Section 4.13. Noise walls will be built where determined to be economically feasible and reasonable.

It will be the responsibility of all contractors on the FAP Route 340 project to determine and comply with the limitations imposed by local ordinances with respect to construction operations, equipment noise and working time restrictions.

4.23.2 Relocation

An access road will be provided for access between the severed portions of the Doede Nursery property. Because the existing land use in the area is agriculture, replacement land is available that would not incur adverse travel to the business or the employees.

4.23.3 Wetlands

[paragraph deleted]

The wetland mitigation for the project occur in three different areas. The first area will be along Spring Creek (Exhibit 4-7) and satisfies Section 404 of the Clean Water Act; the second area occurs within the Lockport Prairie Nature Preserve (Exhibit 4-7a) and satisfies agreements with the U.S. Fish and Wildlife Service and the Forest Preserve District of Will County; and the third area at a location determined by the Illinois Department of Natural Resources and satisfies the regulations issued under the Illinois Interagency Wetland Policy Act of 1989.

The first area is the 16.5 acre mitigation area within the Spring Creek floodplain which will replace the function and value of the 10.4 acres of impacted wetlands. It is anticipated there will be overbank inundation providing opportunities for emergent vegetation.

ISTHA will transfer to the FPDWC, in fee, that property acquired and developed by the ISTHA for wetland mitigation at the Spring Creek site. For proper access, long term management and recreational trail development of the recommended Spring Creek wetland mitigation site, ISTHA will incorporate into the design of this wetland mitigation site an approximate 100 foot border.

The second area for the wetland mitigation is located in the Des Plaines River Valley within the Lockport Prairie Nature Preserve (See Exhibit 4-7a). The restoration area of the Lockport Prairie site is approximately 15 acres; however, only 25 percent would be credited for enhancement, approximately 3.75 acres.

The third area of the wetland mitigation for FAP Route 340 relates to state level regulations. An agreement with IDNR, IDOT, and ISTHA has been made to follow the draft Administrative Rules for the Interagency Wetland Policy Act published October 2, 1995 in the Illinois Register. The updated ratios range from 1.5 to 5.5 to 1.0, depending on the wetland type. Using the updated ratios, the total area required to compensate for wetland impacts is 36.35 acres. IDOT and ISTHA are providing 16.5 acres at the Spring Creek site and 3.75 acres at the Lockport Prairie Nature Preserve. Therefore, the remaining 16.1 acres of wetland mitigation will be provided at an off-site location that will be selected in cooperation with IDNR. This location has not been determined as of the publication of this report. This location will meet all Federal and State requirements.

4.23.4 Landscaping

Landscaping design plans will be distributed to local park and forest preserve districts for their review prior to initiating the bidding process. Tree replacement to mitigate actual tree losses may occur in some of the agricultural, forbland, and shrubland areas associated with the forested tracts crossed by the **preferred** highway alignment. Tree replacement can be performed along the edges of the right-of-way following the establishment of the final drainage grades. Approximately 16,500 trees will be removed due to the construction of FAP Route 340. Replacement ratios will be 1:1 for non-seedlings and 3:1 for seedlings. The replacement species may be similar to the species lost if appropriate environmental conditions still exist to support the species. ISTHA will use native grass seed mixtures on the backslopes of ditches and in some interchange infields..

Fragmentation of forests to be caused by the project will be mitigated by decreasing existing fragmentation at sites in the area. This will be done by reforesting appropriate nonforested tracts of land in the area that are adjacent to or between existing (relatively) large forest tracts, so as to increase the total acreage of continuous forest and thus the acreage of forest interior habitat. The majority of the tree mitigation effort will involve the reforestation effort. The number of acres to be reforested will depend on the density of the plantings. Reforestation will occur on forest preserve property. ISTHA is coordinating this effort with the FPDWC.

Protection and care will be provided for all existing trees and shrubs to remain within the project limits as referenced in Illinois Department of Transportation's Special Provision for Protection and Care of Trees and Shrubs, which will be included in the job specifications. Existing trees and shrubs which are to remain will also be delineated on the plans as will those which are to be removed.

4.23.5 Parklands

Since Keepataw Forest Preserve was purchased using Land and Water Conservation Funds classifying it as Section 6(f) property, the property purchased for highway right-of-way will be replaced with property of at least equal market value and similar utility. **[sentences deleted] ISTHA requires a permanent easement of approximately 12.4 acres and a temporary easement of approximately 3 additional acres in land located in the Keepataw Forest Preserve for use in connection with FAP Route 340. This property has been appraised at \$6,000 per acre. This land was originally purchased with LAWCON funds. As substitution for this property ISTHA will provide what has been commonly referred to as the "Lockport Prairie East" site. This property was appraised at \$365,000 and is approximately 29 acres in size.**

The entire Bluff Oaks Estates subdivision was purchased, prior to development, as a natural resources mitigation measure for Section 4(f) impacts. Any land not used for highway right-of-way from the 24.5 acre parcel will serve as a buffer zone and maintain the area's natural qualities. **[sentence deleted]**